VOLUME XXIV NUMBER SIX

THE NATIONAL GEOGRAPHIC MAGAZINE

JUNE, 1913

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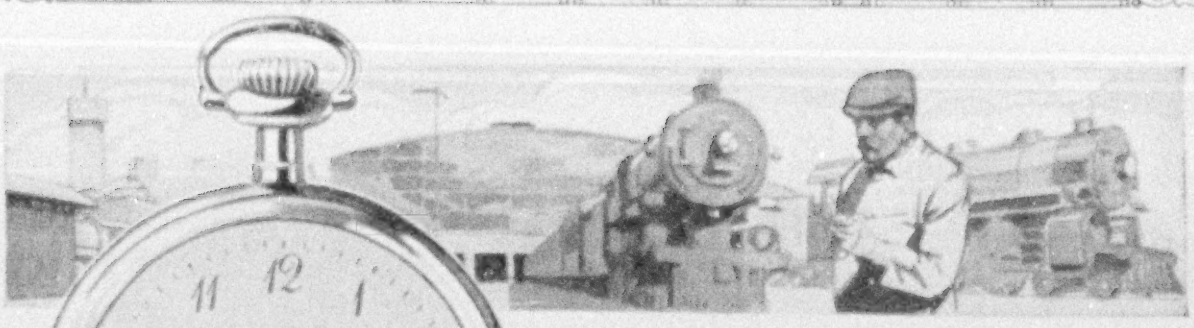

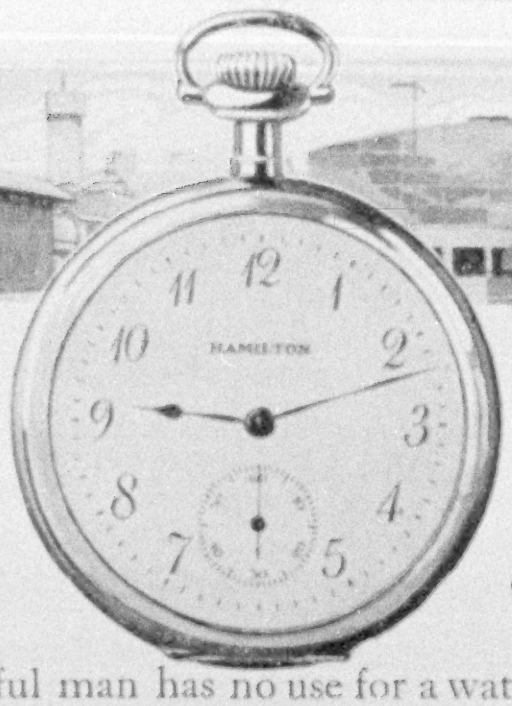

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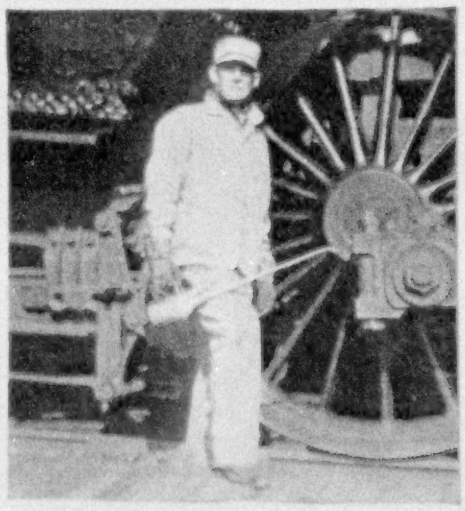

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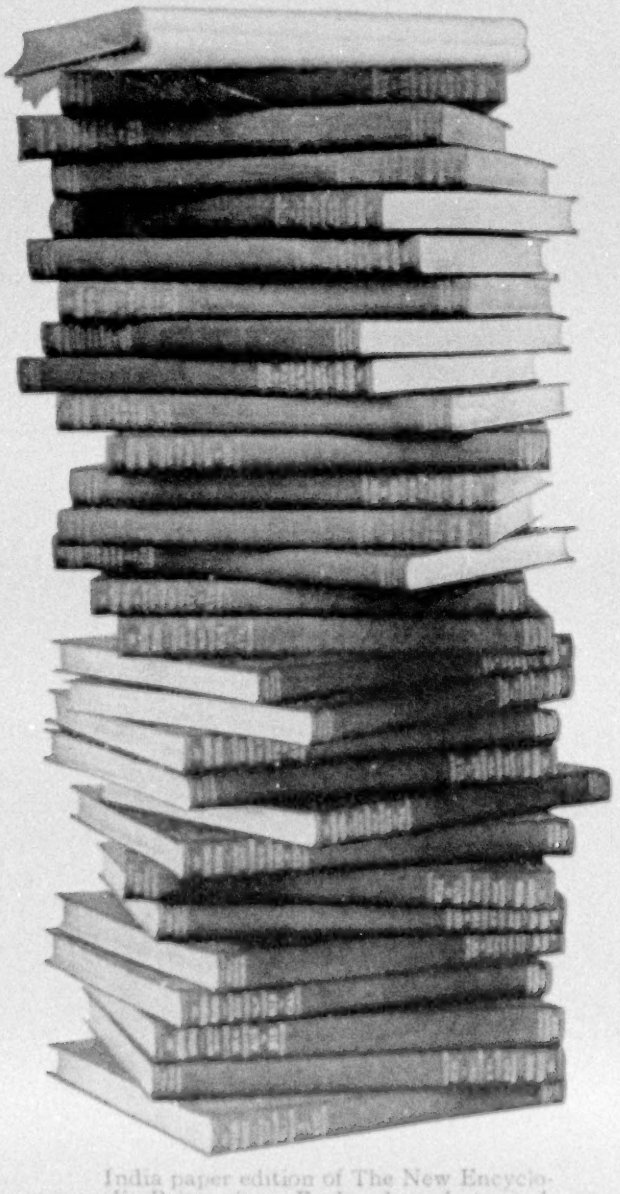

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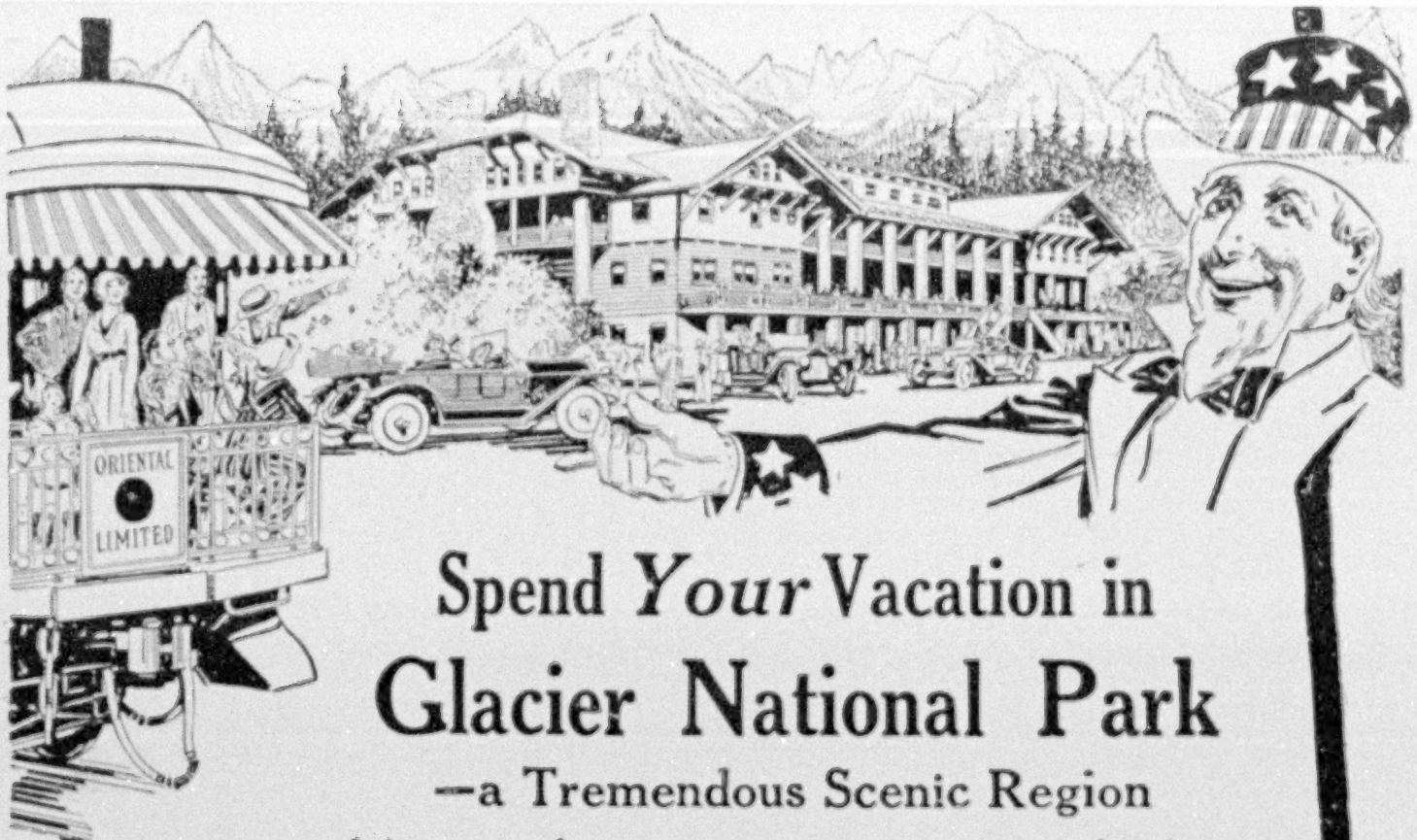

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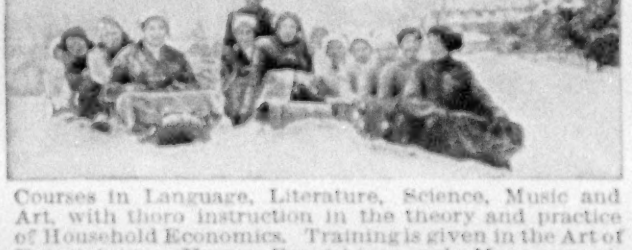

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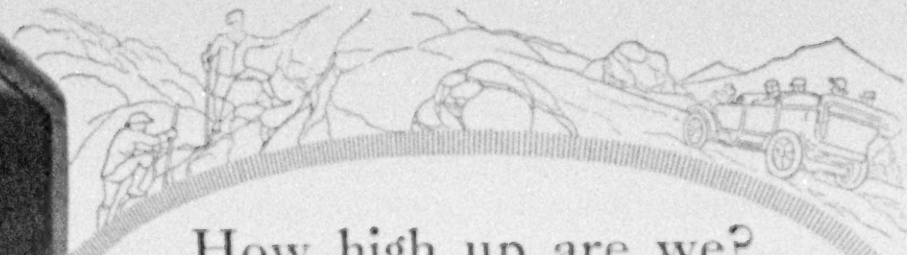

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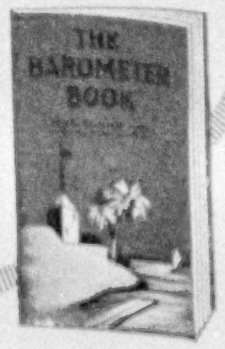

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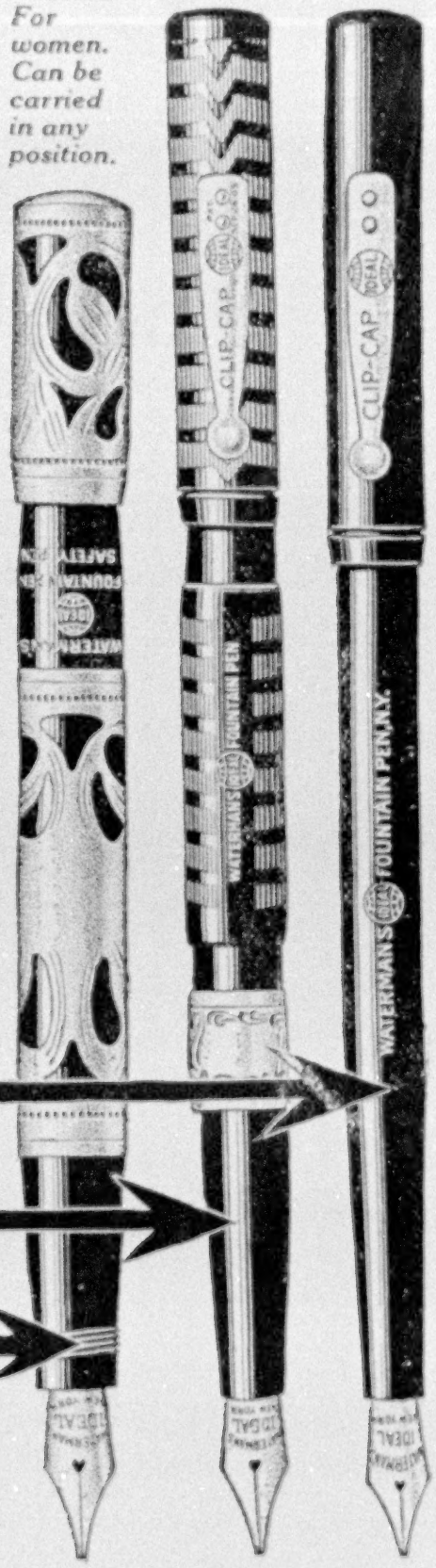

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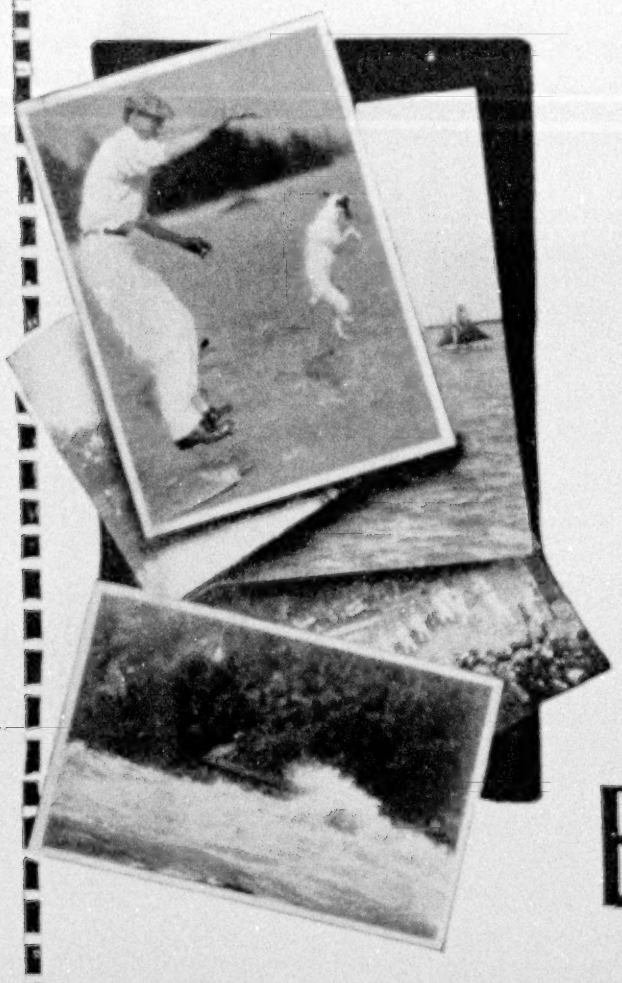

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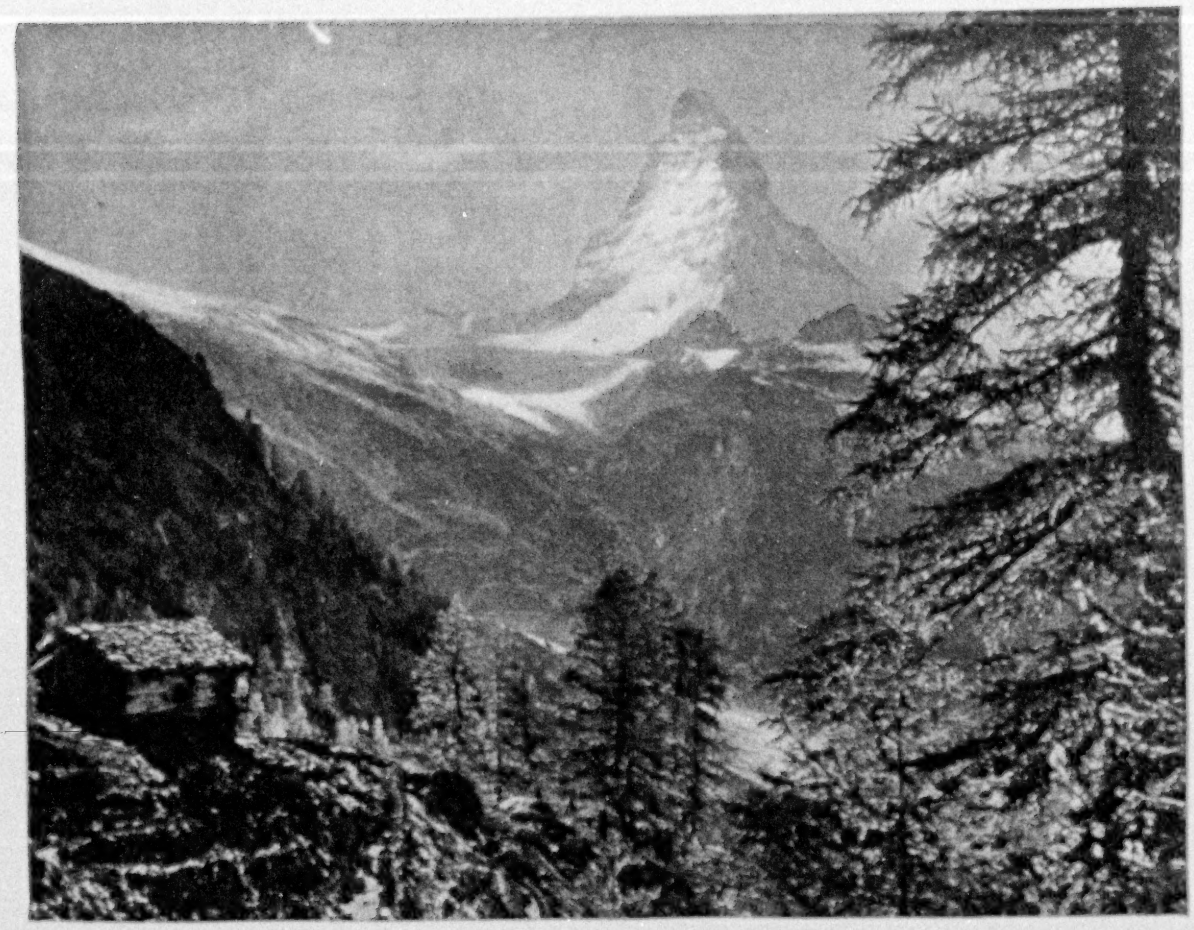

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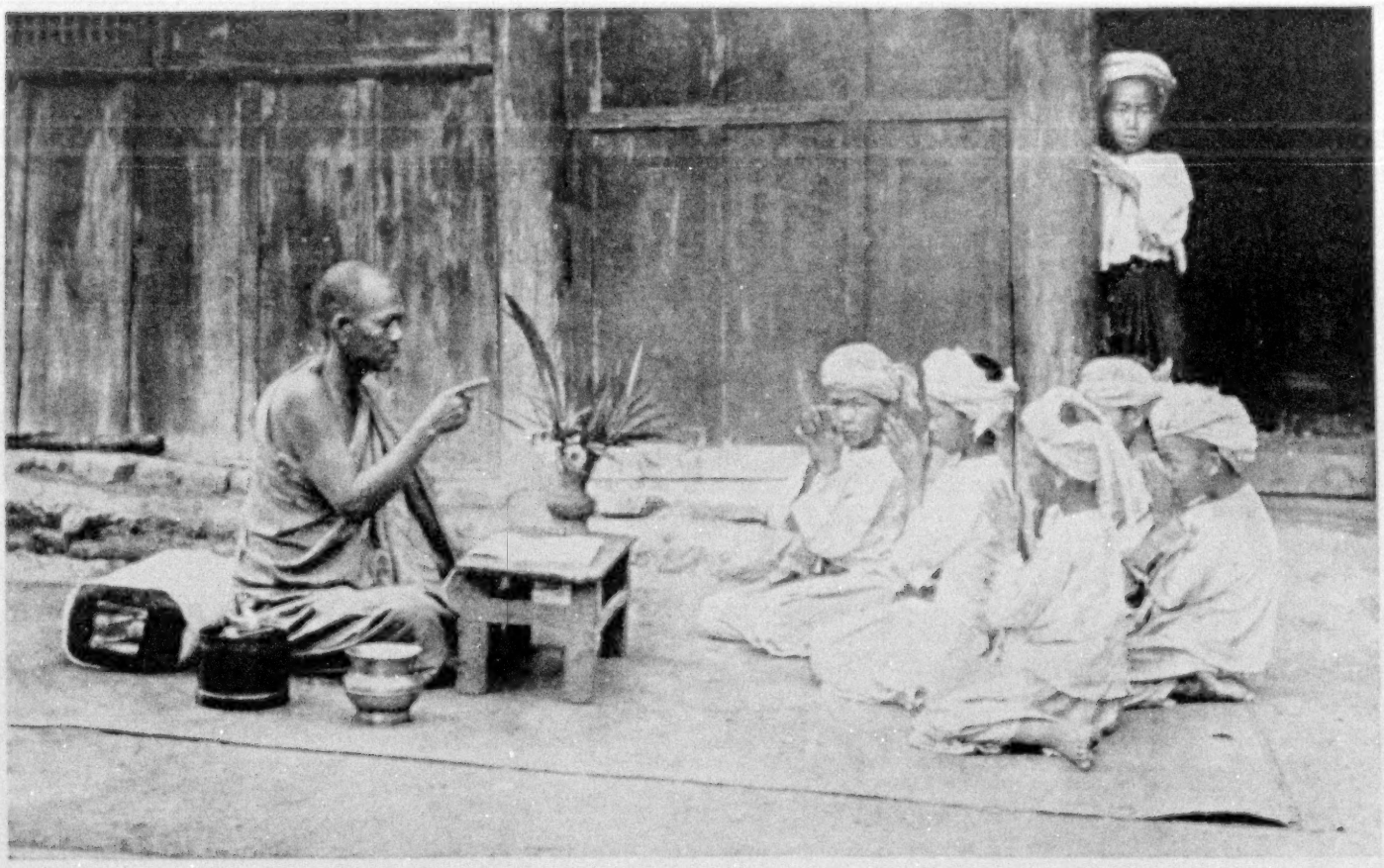

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VOL. XXIV, No. 6 WASHINGTON JUNE, 1913

THE NATIONAL GEOGRAPHIC MAGAZINE

A GEOGRAPHIC ACHIEVEMENT

THROUGH the courtesy of the Secretary of Agriculture, the NATIONAL GEOGRAPHIC MAGAZINE reprints on pages 669-697 of this number "Fifty Common Birds of Farm and Orchard," which was prepared under the direction of Henry W. Henshaw, Chief of the Bureau of the Biological Survey, and published as Farmers' Bulletin 513 of the U. S. Department of Agriculture. The illustrations are all from drawings made by Mr. Louis Agassiz Fuertes, the skillful painter of American birds.

To obtain the exquisite and delicate colors of the pictures, which are such faithful portrayals of the birds, the printed sheets had to pass through the presses eight times, therefore representing nearly two million impressions. This immense amount of work naturally involved a very large expense, but the NATIONAL GEOGRAPHIC MAGAZINE felt justified in spending the many thousands of dollars to republish this wonderful bulletin in order that every reader of the GEOGRAPHIC may have in the household this helpful guide and the accurate and useful information that it contains. The huge outlay required for this colored work would, however, not have been possible but for the great recent increase in the circulation of the Magazine, which has enabled us to bring the cost per copy within reach by distributing the expense over the larger edition.

With the help of these beautiful pictures and clear text the reader will be able easily to identify fifty of our common birds. While this valuable contribution will be specially serviceable in the summer months, when our readers spend more time in the open, it will prove an equally convenient introduction to some of our feathered friends throughout the entire year.

Just as remarkable as the fifty beautiful pictures is the quantity of concise information given about each individual bird, and which is the result of long study by some of the best bird men and women in America. For many years the experts of the Biological Survey have been making accurate tests to determine which birds are useful to man and which destructive. The contents of the stomachs of many thousands of specimens have been analyzed with a view of finding whether the bird helps the farmer by eating injurious insects and noxious weeds, or hurts the farmer by eating his fruits and grain.

These investigations have shown that, with rare exceptions, birds are useful everywhere, and that without their help successful agriculture would be impossible. "The activity of birds in the pursuit of insects is still further stimulated by the fact that the young of most species, even those which are by no means strictly insectivorous, require great quantities of animal food in the early weeks of existence, so that during the summer months—the flood time of insect life—birds are compelled to redouble their at-

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tacks on our insect foes to satisfy the wants of their clamorous young" (see page 671). "A nest with four young of the chipping sparrow was watched at different hours on four days. In the seven hours of observation 119 feedings were noted, or an average of 17 feedings per hour, or 4¼ feedings per hour to each nestling. This would give for a day of 14 hours at least 238 insects eaten by the brood" (see page 682).

Even our hawks and owls, with the exception of Cooper's hawk (see page 694) and one or two others, are desirable, and their presence around a garden or farm should be welcomed, because with their voracious appetites they keep down the numbers of mice and rats and other pests which may torment the country home. As many as 100 grasshoppers have been found in the stomach of a Swainson's hawk, representing a single meal; and in the retreat of a pair of barn owls have been found more than 3,000 skulls, 97 per cent of which were of mammals, the bulk consisting of field mice, house mice, and common rats (see page 670).

A lack of knowledge of the value of certain birds may prove disastrous and cause the destruction of valuable birds which cannot be replaced in years. Some years ago the legislature of the State of Pennsylvania offered a bounty on hawks and owls, which resulted in the killing of over 100,000 of these birds. As almost all of those killed were beneficial, it was calculated by Dr. C. Hart Merriam, then chief of the U. S. Biological Survey, that the State of Pennsylvania sustained a loss of nearly four million dollars in eighteen months. The legislature soon realized its mistake and abolished the bounty.

Quite apart from any question of sentiment, the preservation of our bird life is a matter of great national importance, and every effort should be made to assist our policemen of the air in keeping Nature's balance true.

The bird portraits in colors were printed by the Sackett & Wilhelms Lithograph Company of Brooklyn, N. Y.

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FIFTY COMMON BIRDS OF FARM AND ORCHARD

Prepared under the direction of Henry W. Henshaw, Chief of the Biological Survey, as Bulletin 513 of the U. S. Department of Agriculture, and reprinted in full in the NATIONAL GEOGRAPHIC MAGAZINE, *pages 669-697, by special permission of the Secretary of Agriculture.*

INTRODUCTION.

This bulletin is intended to serve the very practical purpose of enabling our farmers and their boys and girls to identify the birds that frequent the farm and orchard. The material prosperity of State and Nation depends largely on agriculture, and any agent that serves to increase the size of crops and insure their certainty is of direct interest and importance to the farmer. Birds constitute one of the most valuable of these agents, since they depend largely for their food on insects which are among the farmer's most dreaded foes.

Entomologists have estimated that insects yearly cause a loss of upwards of $700,000,000 to the agricultural interests of the United States. Were it not for our birds the loss would be very much greater, and indeed it is believed that without the aid of our feathered friends successful agriculture would be impossible. A knowledge of the birds that protect his crops is, therefore, as important to the farmer as a knowledge of the insect pests that destroy them. Such knowledge is the more important because the relation of birds to man's interests is extremely complex. Thus, while it may be said that most of our birds are useful, there are only a few of them that are always and everywhere useful and that never do harm. Insectivorous birds, for instance, destroy, along with a vast number of harmful insects, some parasitic and predatory kinds. These latter are among Nature's most effective agents for keeping destructive insects in check. To the extent, then, that birds destroy useful parasitic insects, they are harmful. But, taking the year round, the good they do by the destruction of insects injurious to man's interests far outweighs the little harm they do. It may be said, too, that of the birds usually classed as noxious there are very few that do not possess redeeming traits. Thus the crow is mischievous in spring and sorely taxes the farmer's patience and ingenuity to prevent him from pulling up the newly planted corn. Moreover, the crow destroys the eggs and young of useful insectivorous and game birds; but, on the other hand, he eats many insects, especially white grubs and cutworms, and destroys many meadow mice, so that in much (although not all) of the region he inhabits the crow must be considered to be more useful than harmful. Most of the hawks and owls even—birds that have received so bad a name that the farmer's boy and the sportsman are ever on the alert to kill them—are very useful because they destroy vast numbers of insects and harmful rodents.

Birds occupy a unique position among the enemies of insects, since their powers of flight enable them at short notice to gather at points where there are abnormal insect outbreaks. An unusual abundance of grasshoppers, for instance, in a given locality soon attracts the birds from a wide area, and as a rule their visits cease only when there are no grasshoppers left. So also a marked increase in the number of small rodents in a given neighborhood speedily attracts the attention of hawks and owls, which, by reason of their voracious appetites, soon produce a marked diminution of the swarming foe.

America is greatly favored in the number and character of its birds, which not only include some of the gems of the bird world, as the warblers and humming birds, but

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on the whole embrace few destructive species. Not only do many birds satisfy our esthetic sense through their beautiful plumage and their sweet voices, but they are marvelously adapted to their respective fields of activity. No other creatures are so well fitted to capture flying insects as swallows, swifts, and nighthawks. Among the avian ranks also are wrens, trim of body and agile of movement, that creep in and out of holes and crevices and explore rubbish heaps for hidden insects. The woodpecker, whose whole body exhibits wonderful adaptation of means to end, is provided with strong claws for holding firmly when at work, a chisel-like bill driven by powerful muscles to dig out insects, and a long extensible tongue to still further explore the hidden retreats of insects and drag forth the concealed larvæ, safe from other foes. The creepers, titmice, warblers, flycatchers, quails, doves, and other families have each their own special field of activity. However unlike they may be in appearance, structure, and habits, all are similar in one respect—they possess a never flagging appetite for insects and weed seeds.

One of the most useful groups of native birds is the sparrow family. While some of the tribe wear gay suits of many hues, most of the sparrows are clad in modest brown tints, and as they spend much of the time in grass and weeds are commonly overlooked. Unobtrusive as they are, they lay the farmer under a heavy debt of gratitude by their food habits, since their chosen fare consists largely of the seeds of weeds. Selecting a typical member of the group, the tree sparrow, for instance, one-fourth ounce of weed seed per day is a conservative estimate of the food of an adult. On this basis, in a large agricultural State like Iowa tree sparrows annually eat approximately 875 tons of weed seeds. Only the farmer, upon whose shoulders falls the heavy burden of freeing his land of noxious weeds, can realize what this vast consumption of weed seeds means in the saving and cost of labor. Some idea of the money value of this group of birds to the country may be gained from the statement that the total value of the farm products in the United States in 1910 reached the amazing sum of $8,926,000,000. If we estimate that the total consumption of weed seed by the combined members of the sparrow family resulted in a saving of only 1 per cent of the crops—not a violent assumption—the sum saved to farmers by these birds in 1910 was $89,260,000.

The current idea in relation to hawks and owls is erroneous. These birds are generally classed as thieves and robbers, whereas a large majority of them are the farmers' friends and spend the greater part of their long lives in pursuit of injurious insects and rodents. The hawks work by day, the owls chiefly by night, so that the useful activities of the two classes are continued practically throughout the 24 hours. As many as 100 grasshoppers have been found in the stomach of a Swainson's hawk, representing a single meal; and in the retreat of a pair of barn owls have been found more than 3,000 skulls, 97 per cent of which were of mammals, the bulk consisting of field mice, house mice, and common rats. Nearly half a bushel of the remains of pocket gophers—animals which are very destructive in certain parts of the United States—was found near a nest of this species. The notable increase of noxious rodents during the last few years in certain parts of the United States and the consequent damage to crops are due in no small part to the diminished number of birds of prey, which formerly destroyed them and aided in keeping down their numbers. A few hawks are injurious, and the bulk of the depredations on birds and chickens chargeable against hawks is committed by three species—the Cooper's hawk, the sharp-shinned hawk, and the goshawk. The farmer's boy should learn to know these daring robbers by sight, so as to kill them whenever possible.

From the foregoing it will at once appear that the practice of offering bounties indiscriminately for the heads of hawks and owls, as has been done by some States, is a serious mistake, the result being not only a waste of public funds but the destruction of valuable birds which can be replaced, if at all, only after the lapse of years.

As a rule birds do not live very long, but they live fast. They breathe rapidly and have a higher temperature and a more rapid circulation than other vertebrates. This is a fortunate circumstance, since to generate the requisite force to sustain their active bodies a large quantity of food is necessary, and as a matter of fact birds have to devote most of their waking hours to obtaining insects, seeds, berries, and other kinds of food. The activity of birds in the pursuit of insects is still further stimulated by the fact that the young of most species, even those which are by no means strictly insectivorous, require great quantities of animal food in the early weeks of existence, so that during the summer months—the flood time of insect life—birds are compelled to redouble their attacks on our insect foes to satisfy the wants of their clamorous young.

Field observations of the food habits of birds serve a useful purpose, but they are rarely accurate enough to be fully reliable. The presence of certain birds in a corn or wheat field or in an orchard is by no means proof, as is too often assumed, that they are devastating the grain or fruit. They may have been attracted by insects which, unknown to the farmer or orchardist, are fast ruining his crop. Hence it has been found necessary to examine the stomachs and crops of birds to ascertain definitely what and how much they eat. The Biological Survey has in this way examined upward of 50,000 birds, most of which have been obtained during the last 25 years from scientific collectors, for our birds are too useful to be sacrificed when it can possibly be avoided, even for the sake of obtaining data upon which to base legislation for their protection.

It is interesting to observe that hungry birds—and birds are hungry most of the time—are not content to fill their stomachs with insects or seeds, but after the stomach is stuffed until it will hold no more continue to eat till the crop or gullet also is crammed. It is often the case that when the stomach is opened and the contents piled up the pile is two or three times as large as the stomach was when filled. Birds may truly be said to have healthy appetites. To show the astonishing capacity of birds' stomachs and to reveal the extent to which man is indebted to birds for the destruction of noxious insects, the following facts are given as learned by stomach examinations made by assistants of the Biological Survey:

A tree swallow's stomach was found to contain 40 entire chinch bugs and fragments of many others, besides 10 other species of insects. A bank swallow in Texas devoured 68 cotton-boll weevils, one of the worst insect pests that ever invaded the United States; and 35 cliff swallows had taken an average of 18 boll weevils each. Two stomachs of pine siskins from Haywards, Cal., contained 1,900 black olive scales and 300 plant lice. A killdeer's stomach taken in November in Texas contained over 300 mosquito larvæ. A flicker's stomach held 28 white grubs. A nighthawk's stomach collected in Kentucky contained 34 May beetles, the adult form of white grubs. Another nighthawk from New York had eaten 24 clover-leaf weevils and 375 ants. Still another nighthawk had eaten 340 grasshoppers, 52 bugs, 3 beetles, 2 wasps, and a spider. A boat-tailed grackle from Texas had eaten at one meal about 100 cotton bollworms, besides a few other insects. A ring-necked pheasant's crop from Washington contained 8,000 seeds of chickweed and a dandelion head. More than 72,000 seeds have been found in a single duck stomach taken in Louisiana in February.

A knowledge of his bird friends and enemies, therefore, is doubly important to the farmer and orchardist in order that he may protect the kinds that earn protection by their services and may drive away or destroy the others. At the present time many kinds of useful birds need direct intervention in their behalf as never before. The encroachments of civilization on timbered tracts and the methods of modern intensive cultivation by destroying or restricting breeding grounds of birds tend to diminish their ranks. The number of insect pests, on the other hand, is all the time increasing by leaps and bounds through importations from abroad and by migration from adjoin-

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ing territories. Every effort, therefore, should be made to augment the numbers of our useful birds by protecting them from their enemies, by providing nesting facilities, and by furnishing them food in times of stress, especially in winter.

Important in this connection is the planting near the house and even in out-of-the-way places on the farm of various berry-bearing shrubs, many of which are ornamental, which will supply food when snow is on the ground. Other species which are not berry eaters, like the woodpeckers, nuthatches, creepers, and chickadees, can be made winter residents of many farms, even in the North, by putting out at convenient places a supply of suet, of which they and many other birds are very fond, even in summer. Hedges and thickets about the farm are important to furnish nesting sites and shelter both from the elements and from the numerous enemies of birds.

Few are aware of the difficulty often experienced by birds in obtaining water for drinking and bathing, and a constant supply of water near the farmhouse will materially aid in attracting birds to the neighborhood and in keeping them there, at least till the time of migration. Shallow trays of wood or metal admirably serve the purpose, especially as birds delight to bathe in them.

Considerable success has been met with in Germany and elsewhere in Europe by supplying artificial nest boxes for birds, and the same method of increasing the number of birds and attracting them to farms and orchards where their services are most needed should be extensively employed in this country. The experiment can the more easily be tried since several firms in the United States are now prepared to make and deliver boxes specially designed for martins, swallows, bluebirds, wrens, woodpeckers, and other species. The average farmer's boy, however, if provided with a few tools, is quite equal to the task of making acceptable boxes for the commoner species, which are far from fastidious as to the appearance of the box intended for their occupancy.

One of the worst foes of our native birds is the house cat, and probably none of our native wild animals destroys as many birds on the farm, particularly fledglings, as cats. The household pet is by no means blameless in this respect, for the bird-hunting instinct is strong even in the well-fed tabby; but much of the loss of our feathered life is attributable to the half-starved stray, which in summer is as much at home in the groves and fields as the birds themselves. Forced to forage for their own livelihood, these animals, which are almost as wild as the ancestral wildcat, inflict an appalling loss on our feathered allies and even on the smaller game birds like the woodcock and bobwhite. If cats are to find place in the farmer's household, every effort should be made by carefully feeding and watching them to insure the safety of the birds. The cat without a home should be mercifully put out of the way.

In the present bulletin 50 of our commoner birds are discussed, including some that are destructive. They inhabit various parts of the country, and it is for the interest of the farmers of the respective localities to be familiar with them. A colored illustration of each species is given so as to enable the reader to identify the bird at a glance and to permit the descriptive text, at best an unsatisfactory method of identification, to be cut down or altogether dispensed with. The birds were drawn from nature by the well-known bird artist, Louis Agassiz Fuertes. The accounts of the birds' habits are necessarily brief, but they are believed to be sufficient to acquaint the reader with the most prominent characteristics of the several species, at least from the standpoint of their relation to man.

BLUEBIRD (Sialia sialis).

Length,* about 6½ inches.

Range: Breeds in the United States (west to Arizona, Colorado, Wyoming, and Montana), southern Canada, Mexico, and Guatemala; winters in the southern half of the eastern United States and south to Guatemala.

Habits and economic status: The bluebird is one of the most familiar tenants of the farm and dooryard. Everywhere it is hailed as the harbinger of spring, and wherever it chooses to reside it is sure of a warm welcome. This bird, like the robin, phoebe, house wren, and some swallows, is very domestic in its habits. Its favorite nesting sites are crannies in the farm buildings or boxes made for its use or natural cavities in old apple trees. For rent the bird pays amply by destroying insects, and it takes no toll from the farm crop. The bluebird's diet consists of 68 per cent of insects to 32 per cent of vegetable matter. The largest items of insect food are grasshoppers first and beetles next, while caterpillars stand third. All of these are harmful except a few of the beetles. The vegetable food consists chiefly of fruit pulp, only an insignificant portion of which is of cultivated varieties. Among wild fruits elderberries are the favorite. From the above it will be seen that the bluebird does no essential harm, but on the contrary eats many harmful and annoying insects. (See Farmers' Bul. 54, pp. 46–48.)

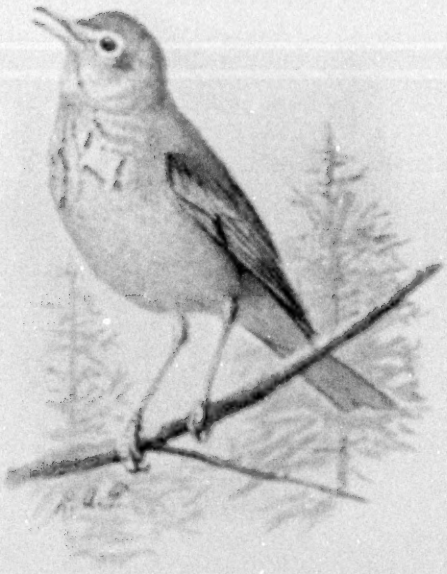
ROBIN (Planesticus migratorius).

Length, 10 inches.

Range: Breeds in the United States (except the Gulf States), Canada, Alaska, and Mexico; winters in most of the United States and south to Guatemala.

Habits and economic status: In the North and some parts of the West the robin is among the most cherished of our native birds. Should it ever become rare where now common, its joyous summer song and familiar presence will be sadly missed in many a homestead. The robin is an omnivorous feeder, and its food includes many orders of insects, with no very pronounced preference for any. It is very fond of earthworms, but its real economic status is determined by the vegetable food, which amounts to about 58 per cent of all. The principal item is fruit, which forms more than 51 per cent of the total food. The fact that in the examination of over 1,200 stomachs the percentage of wild fruit was found to be 5 times that of the cultivated varieties suggests that berry-bearing shrubs, if planted near the orchard, will serve to protect more valuable fruits. In California in certain years it has been possible to save the olive crop from hungry robins only by the most strenuous exertions and considerable expense. The bird's general usefulness is such, however, that all reasonable means of protecting orchard fruit should be tried before killing the birds. (See Farmers' Bul. 54, pp. 44–46.)

* Measured from tip of bill to tip of tail.



RUSSET-BACKED THRUSH (Hylocichla ustulata).

Length, 7¼ inches. Among thrushes having the top of head and tail nearly the same color as the back, this one is distinguished by its tawny eye-ring and cheeks. The Pacific coast subspecies is russet brown above, while the other subspecies is the olive-backed thrush. The remarks below apply to the species as a whole.

Range: Breeds in the forested parts of Alaska and Canada and south to California, Colorado, Michigan, New York, West Virginia (mountains), and Maine; winters from Mexico to South America.

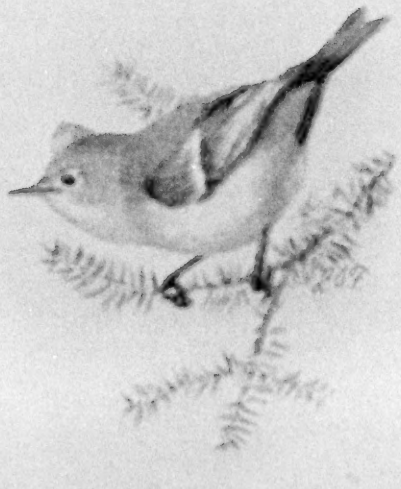
Habits and economic status: This is one of a small group of thrushes the members of which are by many ranked first among American songbirds. The several members resemble one another in size, plumage, and habits. While this thrush is very fond of fruit, its partiality for the neighborhood of streams keeps it from frequenting orchards far from water. It is most troublesome during the cherry season, when the young are in the nest. From this it might be inferred that the young are fed on fruit, but such is not the case. The adults eat fruit, but the nestlings, as usual, are fed mostly upon insects. Beetles constitute the largest item of animal food, and ants come next. Many caterpillars also are eaten. The great bulk of vegetable food consists of fruit, of which two-fifths is of cultivated varieties. Where these birds live in or near gardens or orchards, they may do considerable damage, but they are too valuable as insect destroyers to be killed if the fruit can be protected in any other way. (See Biol. Surv. Bul. 30, pp. 86–92.)

RUBY-CROWNED KINGLET (Regulus calendula).

Length, about 4¼ inches. Olive green above, soiled whitish below, concealed feathers on head (crest) bright red.

Range: Breeds in southern Canada, southern Alaska, and the higher mountains of the western United States; winters in much of the United States and south to Guatemala.

Habits and economic status: In habits and haunts this tiny sprite resembles a chickadee. It is an active, nervous little creature, flitting hither and yon in search of food, and in spring stopping only long enough to utter its beautiful song, surprisingly loud for the size of the musician. Three-fourths of its food consists of wasps, bugs, and flies. Beetles are the only other item of importance (12 per cent). The bugs eaten by the kinglet are mostly small, but, happily, they are the most harmful kinds. Treehoppers, leafhoppers, and jumping plant lice are pests and often do great harm to trees and smaller plants, while plant lice and scale insects are the worst scourges of the fruit grower—in fact, the prevalence of the latter has almost risen to the magnitude of a national peril. It is these small and seemingly insignificant birds that most successfully attack and hold in check these insidious foes of horticulture. The vegetable food consists of seeds of poison ivy, or poison oak, a few weed seeds, and a few small fruits, mostly elderberries. (See Biol. Surv. Bul. 30, pp. 81–84.)



CHICKADEE (Penthestes atricapillus).

Length, about 5¼ inches.

Range: Resident in the United States (except the southern half east of the plains), Canada, and Alaska.

Habits and economic status: Because of its delightful notes, its confiding ways, and its fearlessness, the chickadee is one of our best-known birds. It responds to encouragement, and by hanging within its reach a constant supply of suet the chickadee can be made a regular visitor to the garden and orchard. Though insignificant in size, titmice are far from being so from the economic standpoint, owing to their numbers and activity. While one locality is being scrutinized for food by a larger bird, 10 are being searched by the smaller species. The chickadee's food is made up of insects and vegetable matter in the proportion of 7 of the former to 3 of the latter. Moths and caterpillars are favorites and form about one-third of the whole. Beetles, ants, wasps, bugs, flies, grasshoppers, and spiders make up the rest. The vegetable food is composed of seeds, largely those of pines, with a few of the poison ivy and some weeds. There are few more useful birds than the chickadees. (See Farmers' Bul. 54, pp. 43–44.)

WHITE-BREASTED NUTHATCH (Sitta carolinensis).

Length, 6 inches. White below, above gray, with a black head.

Range: Resident in the United States, southern Canada, and Mexico.

Habits and economic status: This bird might readily be mistaken by a careless observer for a small woodpecker, but its note, an oft-repeated *yank*, is very unwoodpecker-like, and, unlike either woodpeckers or creepers, it climbs downward as easily as upward and seems to set the laws of gravity at defiance. The name was suggested by the habit of wedging nuts, especially beechnuts, in the crevices of bark so as to break them open by blows from the sharp, strong bill. The nuthatch gets its living from the trunks and branches of trees, over which it creeps from daylight to dark. Insects and spiders constitute a little more than 50 per cent of its food. The largest items of these are beetles, moths, and caterpillars, with ants and wasps. The animal food is all in the bird's favor except a few ladybird beetles. More than half of the vegetable food consists of mast, i. e., acorns and other nuts or large seeds. One-tenth of the food is grain, mostly waste corn. The nuthatch does no injury, so far as known, and much good.

BROWN CREEPER (Certhia familiaris americana and other subspecies).

Length, 5½ inches.

Range: Breeds from Nebraska, Indiana, North Carolina (mountains), and Massachusetts north to southern Canada, also in the mountains of the western United States, north to Alaska, south to Nicaragua; winters over most of its range.

Habits and economic status: Rarely indeed is the creeper seen at rest. It appears to spend its life in an incessant scramble over the trunks and branches of trees, from which it gets all its food. It is protectively colored so as to be practically invisible to its enemies and, though delicately built, possesses amazingly strong claws and feet. Its tiny eyes are sharp enough to detect insects so small that most other species pass them by, and altogether the creeper fills a unique place in the ranks of our insect destroyers. The food consists of minute insects and insects' eggs, also cocoons of tineid moths, small wasps, ants, and bugs, especially scales and plant lice, with some small caterpillars. As the creeper remains in the United States throughout the year, it naturally secures hibernating insects and insects' eggs, as well as spiders and spiders' eggs, that are missed by the summer birds. On its bill of fare we find no product of husbandry nor any useful insects.

HOUSE WREN (Troglodytes aëdon).

Length, 4¾ inches. The only one of our wrens with wholly whitish underparts that lacks a light line over the eye.

Range: Breeds throughout the United States (except the South Atlantic and Gulf States) and southern Canada; winters in the southern United States and Mexico.

Habits and economic status: The rich, bubbling song of the familiar little house wren is one of the sweetest associations connected with country and suburban life. Its tiny body, long bill, sharp eyes, and strong feet peculiarly adapt it for creeping into all sorts of nooks and crannies where lurk the insects it feeds on. A cavity in a fence post, a hole in a tree, or a box will be welcomed alike by this busybody as a nesting site; but since the advent of the quarrelsome English sparrow such domiciles are at a premium and the wren's eggs and family are safe only in cavities having entrances too small to admit the sparrow. Hence it behooves the farmer's boy to provide boxes the entrances to which are about an inch in diameter, nailing these under gables of barns and outhouses or in orchard trees. In this way the numbers of this useful bird can be increased, greatly to the advantage of the farmer. Grasshoppers, beetles, caterpillars, bugs, and spiders are the principal elements of its food. Cutworms, weevils, ticks, and plant lice are among the injurious forms eaten. The nestlings of house wrens consume great quantities of insects. (See Yearbook U. S. Dept. Agric. 1895, pp. 416–418, and Biol. Survey Bul. 30, pp. 60–62.)

BROWN THRASHER (Toxostoma rufum).

Length, about 11 inches. Brownish red above, heavily streaked with black below.

Range: Breeds from the Gulf States to southern Canada and west to Colorado, Wyoming, and Montana; winters in the southern half of the eastern United States.

Habits and economic status: The brown thrasher is more retiring than either the mocking bird or catbird, but like them is a splendid singer. Not infrequently, indeed, its song is taken for that of its more famed cousin, the mocking bird. It is partial to thickets and gets much of its food from the ground. Its search for this is usually accompanied by much scratching and scattering of leaves; whence its common name. Its call note is a sharp sound like the smacking of lips, which is useful in identifying this long-tailed, thicket-haunting bird, which does not much relish close scrutiny. The brown thrasher is not so fond of fruit as the catbird and mocker, but devours a much larger percentage of animal food. Beetles form one-half of the animal food, grasshoppers and crickets one-fifth, caterpillars, including cutworms, somewhat less than one-fifth, and bugs, spiders, and millipeds comprise most of the remainder. The brown thrasher feeds on such coleopterous pests as wireworms, May beetles, rice weevils, rose beetles, and figeaters. By its destruction of these and other insects, which constitute more than 60 per cent of its food, the thrasher much more than compensates for that portion (about one-tenth) of its diet derived from cultivated crops. (See Yearbook U. S. Dept. Agric. 1895, pp. 411–415.)

CATBIRD (Dumetella carolinensis).

Length, about 9 inches. The slaty gray plumage and black cap and tail are distinctive.

Range: Breeds throughout the United States west to New Mexico, Utah, Oregon, and Washington, and in southern Canada; winters from the Gulf States to Panama.

Habits and economic status: In many localities the catbird is one of the commonest birds. Tangled growths are its favorite nesting places and retreats, but berry patches and ornamental shrubbery are not disdained. Hence the bird is a familiar dooryard visitor. The bird has a fine song, unfortunately marred by occasional cat calls. With habits similar to those of the mocking bird and a song almost as varied, the catbird has never secured a similar place in popular favor. Half of its food consists of fruit, and the cultivated crops most often injured are cherries, strawberries, raspberries, and blackberries. Beetles, ants, crickets, and grasshoppers are the most important element of its animal food. The bird is known to attack a few pests, as cutworms, leaf beetles, clover-root curculio, and the periodical cicada, but the good it does in this way probably does not pay for the fruit it steals. The extent to which it should be protected may perhaps be left to the individual cultivator; that is, it should be made lawful to destroy catbirds that are doing manifest damage to crops. (See Yearbook U. S. Dept. Agric. 1895, pp. 406–411.)

XUM

MOCKING BIRD (Mimus polyglottos).

Length, 10 inches. Most easily distinguished from the similarly colored loggerhead shrike (see p. 679) by the absence of a conspicuous black stripe through the eye.

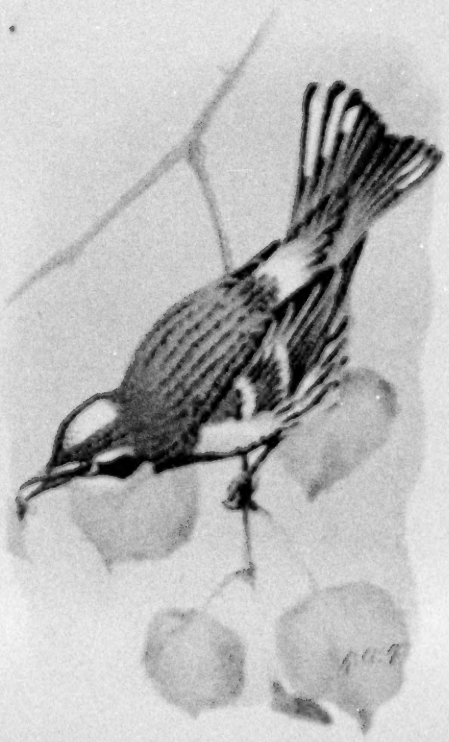
Range: Resident from southern Mexico north to California, Wyoming, Iowa, Ohio, and Maryland; casual farther north.

Habits and economic status: Because of its incomparable medleys and imitative powers, the mocking bird is the most renowned singer of the Western Hemisphere. Even in confinement it is a masterly performer, and formerly thousands were trapped and sold for cage birds, but this reprehensible practice has been largely stopped by protective laws. It is not surprising, therefore, that the mocking bird should receive protection principally because of its ability as a songster and its preference for the vicinity of dwellings. Its place in the affections of the South is similar to that occupied by the robin in the North. It is well that this is true, for the bird appears not to earn protection from a strictly economic standpoint. About half of its diet consists of fruit, and many cultivated varieties are attacked, such as oranges, grapes, figs, strawberries, blackberries, and raspberries. Somewhat less than a fourth of the food is animal matter, and grasshoppers are the largest single element. The bird is fond of cotton worms, and is known to feed also on the chinch bug, rice weevil, and bollworm. It is unfortunate that it does not feed on injurious insects to an extent sufficient to offset its depredations on fruit. (See Yearbook U. S. Dept. Agric. 1895, pp. 415–416, and Biol. Survey Bul. 30, pp. 52–56.)

MYRTLE WARBLER (Dendroica coronata).

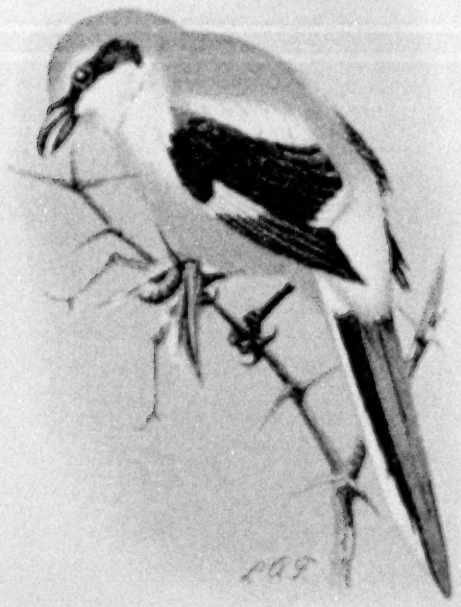
Length, 5¼ inches. The similarly colored Audubon's warbler has a yellow throat instead of a white one.

Range: Breeds throughout most of the forested area of Canada and south to Minnesota, Michigan, New York, and Massachusetts; winters in the southern two-thirds of the United States and south to Panama.



Habits and economic status: This member of our beautiful wood warbler family, a family peculiar to America, has the characteristic voice, coloration, and habits of its kind. Trim of form and graceful of motion, when seeking food it combines the methods of the wrens, creepers, and flycatchers. It breeds only in the northern parts of the eastern United States, but in migration it occurs in every patch of woodland and is so numerous that it is familiar to every observer. Its place is taken in the West by Audubon's warbler. More than three-fourths of the food of the myrtle warbler consists of insects, practically all of them harmful. It is made up of small beetles, including some weevils, with many ants and wasps. This bird is so small and nimble that it successfully attacks insects too minute to be prey for larger birds. Scales and plant lice form a very considerable part of its diet. Flies are the largest item of food; in fact, only a few flycatchers and swallows eat as many flies as this bird. The vegetable food (22 per cent) is made up of fruit and the seeds of poison oak or ivy, also the seeds of pine and of the bayberry.

LOGGERHEAD SHRIKE (Lanius ludovicianus).



Length, about 9 inches. A gray, black, and white bird, distinguished from the somewhat similarly colored mocking bird by the black stripe on side of head.

Range: Breeds throughout the United States, Mexico, and southern Canada; winters in the southern half of the United States and in Mexico.

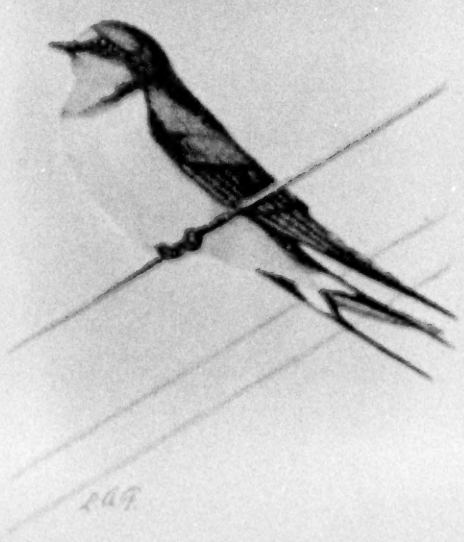
Habits and economic status: The loggerhead shrike, or southern butcher bird, is common throughout its range and is sometimes called "French mocking bird" from a superficial resemblance and not from its notes, which are harsh and unmusical. The shrike is naturally an insectivorous bird which has extended its bill of fare to include small mammals, birds, and reptiles. Its hooked beak is well adapted to tearing its prey, while to make amends for the lack of talons it has hit upon the plan of forcing its victim, if too large to swallow, into the fork of a bush or tree, where it can tear it asunder. Insects, especially grasshoppers, constitute the larger part of its food, though beetles, moths, caterpillars, ants, wasps, and a few spiders also are taken. While the butcher bird occasionally catches small birds, its principal vertebrate food is small mammals, as field mice, shrews, and moles, and when possible it obtains lizards. It habitually impales its surplus prey on a thorn, sharp twig, or barb of a wire fence. (See Biol. Survey Bul. 9, pp. 20–24, and Bul. 30, pp. 33–38.)

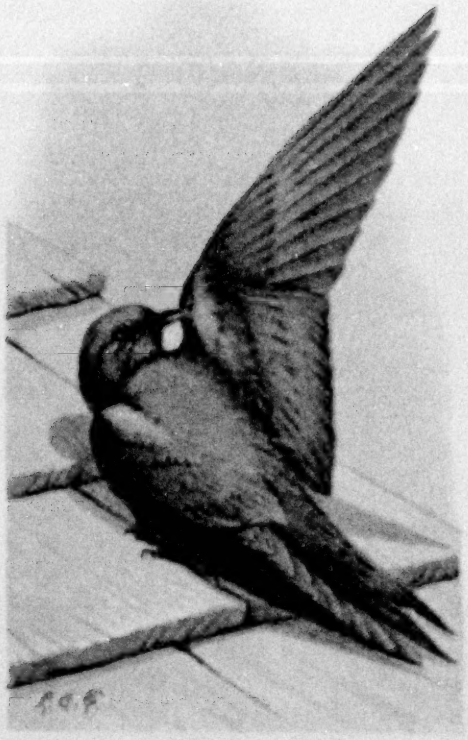
BARN SWALLOW (Hirundo erythrogastra).

Length, about 7 inches. Distinguished among our swallows by deeply forked tail.

Range: Breeds throughout the United States (except the South Atlantic and Gulf States) and most of Canada; winters in South America.

Habits and economic status: This is one of the most familiar birds of the farm and one of the greatest insect destroyers. From daylight to dark on tireless wings it seeks its prey, and the insects destroyed are countless. Its favorite nesting site is a barn rafter, upon which it sticks its mud basket. Most modern barns are so tightly constructed that swallows can not gain entrance, and in New England and some other parts of the country barn swallows are much less numerous than formerly. Farmers can easily provide for the entrance and exit of the birds and so add materially to their numbers. It may be well to add that the parasites that sometimes infest the nests of swallows are not the ones the careful housewife dreads, and no fear need be felt of the infestation spreading to the houses. Insects taken on the wing constitute the almost exclusive diet of the barn swallow. More than one-third of the whole consists of flies, including unfortunately some useful parasitic species. Beetles stand next in order and consist of a few weevils and many of the small dung beetles of the May beetle family that swarm over the pastures in the late afternoon. Ants amount to more than one-fifth of the whole food, while wasps and bees are well represented.





PURPLE MARTIN (Progne subis).

Length, about 8 inches.

Range: Breeds throughout the United States and southern Canada, south to central Mexico; winters in South America.

Habits and economic status: This is the largest as it is one of the most beautiful of the swallow tribe. It formerly built its nests in cavities of trees, as it still does in wild districts, but learning that man was a friend it soon adopted domestic habits. Its presence about the farm can often be secured by erecting houses suitable for nesting sites and protecting them from usurpation by the English sparrow, and every effort should be made to increase the number of colonies of this very useful bird. The boxes should be at a reasonable height, say 15 feet from the ground, and made inaccessible to cats. A colony of these birds on a farm makes great inroads upon the insect population, as the birds not only themselves feed upon insects but rear their young upon the same diet. Fifty years ago in New England it was not uncommon to see colonies of 50 pairs of martins, but most of them have now vanished for no apparent reason except that the martin houses have decayed and have not been renewed. More than three-fourths of this bird's food consists of wasps, bugs, and beetles, their importance being in the order given. The beetles include several species of harmful weevils, as the clover-leaf weevils and the nut weevils. Besides these are many crane flies, moths, May flies, and dragonflies.

BLACK-HEADED GROSBEAK (Zamelodia melanocephala).

Length, about 8¼ inches.

Range: Breeds from the Pacific coast to Nebraska and the Dakotas, and from southern Canada to southern Mexico; winters in Mexico.

Habits and economic status: The black-headed grosbeak takes the place in the West of the rosebreast in the East, and like it is a fine songster. Like it also the blackhead readily resorts to orchards and gardens and is common in agricultural districts. The bird has a very powerful bill and easily crushes or cuts into the firmest fruit. It feeds upon cherries, apricots, and other fruits, and also does some damage to green peas and beans, but it is so active a foe of certain horticultural pests that we can afford to overlook its faults. Several kinds of scale insects are freely eaten, and one, the black olive scale, constitutes a fifth of the total food. In May many cankerworms and codling moths are consumed, and almost a sixth of the bird's seasonal food consists of flower beetles, which do incalculable damage to cultivated flowers and to ripe fruit. For each quart of fruit consumed by the black-headed grosbeak it destroys in actual bulk more than 1½ quarts of black olive scales and 1 quart of flower beetles, besides a generous quantity of codling-moth pupæ and cankerworms. It is obvious that such work as this pays many times over for the fruit destroyed. (See Biol. Survey Bul. 32, pp. 60–77.)

ROSE-BREASTED GROSBEAK (Zamelodia ludoviciana).

Length, 8 inches.

Range: Breeds from Kansas, Ohio, Georgia (mountains), and New Jersey, north to southern Canada; winters from Mexico to South America.

Habits and economic status: This beautiful grosbeak is noted for its clear, melodious notes, which are poured forth in generous measure. The rosebreast sings even at midday during summer, when the intense heat has silenced almost every other songster. Its beautiful plumage and sweet song are not its sole claim on our favor, for few birds are more beneficial to agriculture. The rosebreast eats some green peas and does some damage to fruit. But this mischief is much more than balanced by the destruction of insect pests. The bird is so fond of the Colorado potato beetle that it has earned the name of "potato-bug bird," and no less than a tenth of the total food of the rosebreasts examined consists of potato beetles—evidence that the bird is one of the most important enemies of the pest. It vigorously attacks cucumber beetles and many of the scale insects. It proved an active enemy of the Rocky Mountain locust during that insect's ruinous invasions, and among the other pests it consumes are the spring and fall cankerworms, orchard and forest tent caterpillars, tussock, gipsy, and brown-tail moths, plum curculio, army worm, and chinch bug. In fact, not one of our birds has a better record. (See Biol. Survey Bul. 32, pp. 33-59.)

SONG SPARROW (Melospiza melodia).

Length, about 6¼ inches. The heavily spotted breast with heavy central blotch is characteristic.

Range: Breeds in the United States (except the South Atlantic and Gulf States), southern Canada, southern Alaska, and Mexico; winters in Alaska and most of the United States southward.

Habits and economic status: Like the familiar little "chippy," the song sparrow is one of our most domestic species, and builds its nest in hedges or in garden shrubbery close to houses, whenever it is reasonably safe from the house cat, which, however, takes heavy toll of the nestlings. It is a true harbinger of spring, and its delightful little song is trilled forth from the top of some green shrub in early March and April, before most of our other songsters have thought of leaving the sunny south. Song sparrows vary much in habits, as well as in size and coloration. Some forms live along streams bordered by deserts, others in swamps among bulrushes and tules, others in timbered regions, others on rocky barren hillsides, and still others in rich, fertile valleys. With such a variety of habitat, the food of the species naturally varies considerably. About three-fourths of its diet consists of the seeds of noxious weeds and one-fourth of insects. Of these, beetles, especially weevils, constitute the major portion. Ants, wasps, bugs (including the black olive scale), and caterpillars are also eaten. Grasshoppers are taken by the eastern birds, but not by the western ones. (See Biol. Survey Bul. 15, pp. 82–86.)

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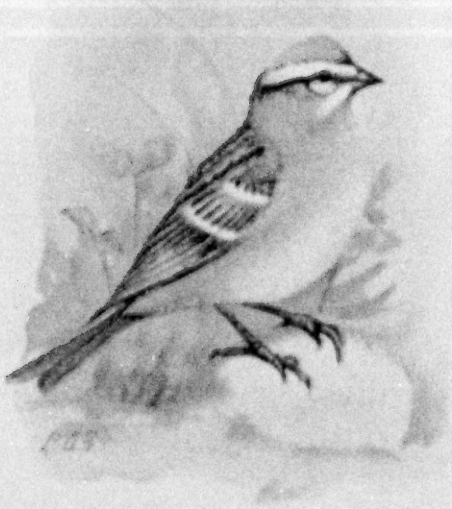


CHIPPING SPARROW (Spizella passerina).

Length, about 5¼ inches. Distinguished by the chestnut crown, black line through eye, and black bill.

Range: Breeds throughout the United States, south to Nicaragua, and north to southern Canada; winters in the southern United States and southward.

Habits and economic status: The chipping sparrow is very friendly and domestic, and often builds its nest in gardens and orchards or in the shrubbery close to dwellings. Its gentle and confiding ways endear it to all bird lovers. It is one of the most insectivorous of all the sparrows. Its diet consists of about 42 per cent of insects and spiders and 58 per cent of vegetable matter. The animal food consists largely of caterpillars, of which it feeds a great many to its young. Besides these, it eats beetles, including many weevils, of which one stomach contained 30. It also eats ants, wasps, and bugs. Among the latter are plant lice and black olive scales. The vegetable food is practically all weed seed. A nest with 4 young of this species was watched at different hours on 4 days. In the 7 hours of observation 119 feedings were noted, or an average of 17 feedings per hour, or 4¼ feedings per hour to each nestling. This would give for a day of 14 hours at least 238 insects eaten by the brood. (See Biol. Survey Bul. 15, pp. 76–78.)

WHITE-CROWNED SPARROW (Zonotrichia leucophrys).

Length, 7 inches. The only similar sparrow, the white-throat, has a yellow spot in front of eye.

Range: Breeds in Canada, the mountains of New Mexico, Colorado, Wyoming, and Montana, and thence to the Pacific coast; winters in the southern half of the United States and in northern Mexico.

Habits and economic status: This beautiful sparrow is much more numerous in the western than in the eastern States, where, indeed, it is rather rare. In the East it is shy and retiring, but it is much bolder and more conspicuous in the far West and there often frequents gardens and parks. Like most of its family it is a seed eater by preference, and insects comprise very little more than 7 per cent of its diet. Caterpillars are the largest item, with some beetles, a few ants and wasps, and some bugs, among which are black olive scales. The great bulk of the food, however, consists of weed seeds, which amount to 74 per cent of the whole. In California this bird is accused of eating the buds and blossoms of fruit trees, but buds or blossoms were found in only 30 out of 516 stomachs, and probably it is only under exceptional circumstances that it does any damage in this way. Evidently neither the farmer nor the fruit grower has much to fear from the white-crowned sparrow. The little fruit it eats is mostly wild, and the grain eaten is waste or volunteer. (See Biol. Survey Bul. 34, pp. 75–77.)

ENGLISH SPARROW (Passer domesticus).

Length, about 6¼ inches. Its incessant chattering, quarrelsome disposition, and abundance and familiarity about human habitations distinguish it from our native sparrows.

Range: Resident throughout the United States and southern Canada.

Habits and economic status: Almost universally condemned since its introduction into the United States, the English sparrow has not only held its own, but has ever increased in numbers and extended its range in spite of all opposition. Its habit of driving out or even killing more beneficial species and the defiling of buildings by its droppings and by its own unsightly structures, are serious objections to this sparrow. Moreover, in rural districts, it is destructive to grain, fruit, peas, beans, and other vegetables. On the other hand, the bird feeds to some extent on a large number of insect pests, and this fact points to the need of a new investigation of the present economic status of the species, especially as it promises to be of service in holding in check the newly introduced alfalfa weevil, which threatens the alfalfa industry in Utah and neighboring States. In cities most of the food of the English sparrow is waste material secured from the streets.

CROW BLACKBIRD (Quiscalus quiscula).

Length, 12 inches. Shorter by at least 3 inches than the other grackles with trough-shaped tails. Black, with purplish, bluish, and bronze reflections.

Range: Breeds throughout the United States west to Texas, Colorado, and Montana, and in southern Canada; winters in the southern half of the breeding range.

Habits and economic status: This blackbird is a beautiful species, and is well known from its habit of congregating in city parks and nesting there year after year. Like other species which habitually assemble in great flocks, it is capable of inflicting much damage on any crop it attacks, and where it is harmful a judicious reduction of numbers is probably sound policy.

It shares with the crow and blue jay the evil habit of pillaging the nests of small birds of eggs and young. Nevertheless it does much good by destroying insect pests, especially white grubs, weevils, grasshoppers, and caterpillars. Among the caterpillars are army worms and other cutworms. When blackbirds gather in large flocks, as in the Mississippi Valley, they may greatly damage grain, either when first sown or when in the milk. In winter they subsist mostly on weed seed and waste grain. (See Biol. Surv. Bul. 13, pp. 53–70.)

XUM

BREWER'S BLACKBIRD (Euphagus cyanocephalus).

Length, 10 inches. Its glossy purplish head distinguishes it from other blackbirds that do not show in flight a trough-shaped tail.

Range: Breeds in the West, east to Texas, Kansas, and Minnesota, and north to southern Canada; winters over most of the United States breeding range, south to Guatemala.

Habits and economic status: Very numerous in the West and in fall gathers in immense flocks, especially about barnyards and corrals. During the cherry season in California Brewer's blackbird is much in the orchards. In one case they were seen to eat freely of cherries, but when a neighboring fruit raiser began to plow his orchard almost every blackbird in the vicinity was upon the newly opened ground and close at the plowman's heels in its eagerness to get the insects exposed by the plow. Caterpillars and pupæ form the largest item of animal food (about 12 per cent). Many of these are cutworms, and cotton bollworms or corn earworms were found in 10 stomachs and codling-moth pupæ in 11. Beetles constitute over 11 per cent of the food. The vegetable food is practically contained in three items—grain, fruit, and weed seeds. Grain, mostly oats, amounts to 54 per cent; fruit, largely cherries, 4 per cent; and weed seeds, not quite 9 per cent. The grain is probably mostly wild, volunteer, or waste, so that the bird does most damage by eating fruit. (See Biol. Surv. Bul. 34, pp. 59–65.)

BULLOCK'S ORIOLE (Icterus bullocki).

Length, about 8 inches. Our only oriole with top of head and throat black and cheeks orange.

Range: Breeds from South Dakota, Nebraska, and Kansas to the Pacific Ocean and from southern Canada to northern Mexico; winters in Mexico.

Habits and economic status: In the West this bird takes the place occupied in the East by the Baltimore oriole. In food, nesting habits, and song the birds are similar. Both are migratory and remain on their summer range only some five or six months. They take kindly to orchards, gardens, and the vicinity of farm buildings and often live in villages and city parks. Their diet is largely made up of insects that infest orchards and gardens. When fruit trees are in bloom they are constantly busy among the blossoms and save many of them from destruction. In the food of Bullock's oriole beetles amount to 35 per cent and nearly all are harmful. Many of these are weevils, some of which live upon acorns and other nuts. Ants and wasps amount to 15 per cent of the diet. The black olive scale was found in 45 of the 162 stomachs examined. Caterpillars, with a few moths and pupæ, are the largest item of food and amount to over 41 per cent. Among these were codling-moth larvæ. The vegetable food is practically all fruit (19 per cent) and in cherry season consists largely of that fruit. Eating small fruits is the bird's worst trait, but it will do harm in this way only when very numerous. (See Biol. Surv. Bul. 34, pp. 68–71.)

MEADOWLARKS (Sturnella magna and Sturnella neglecta).

Length, about 10¼ inches.

Range: Breed generally in the United States, southern Canada, and Mexico to Costa Rica; winter from the Ohio and Potomac Valleys and British Columbia southward.

Habits and economic status: Our two meadowlarks, though differing much in song, resemble each other closely in plumage and habits. Grassy plains and uplands covered with a thick growth of grass or weeds, with near-by water, furnish the conditions best suited to the meadowlark's taste. The song of the western bird is loud, clear, and melodious. That of its eastern relative is feebler and loses much by comparison. In many localities the meadowlark is classed and shot as a game bird. From the farmer's standpoint this is a mistake, since its value as an insect eater is far greater than as an object of pursuit by the sportsman. Both the boll weevil, the foe of the cotton grower, and the alfalfa weevil are among the beetles it habitually eats. Twenty-five per cent of the diet of this bird is beetles, half of which are predaceous ground beetles, accounted useful insects, and one-fifth are destructive weevils. Caterpillars form 11 per cent of the food and are eaten in every month in the year. Among these are many cutworms and the well-known army worm. Grasshoppers are favorite food and are eaten in every month and almost every day. The vegetable food (24 per cent of the whole) consists of grain and weed seeds. (See Yearbook U. S. Dept. Agr. 1895, pp. 420–426.)

RED-WINGED BLACKBIRD (Agelaius phœniceus).

Length, about 9½ inches.

Range: Breeds in Mexico and North America south of the Barren Grounds; winters in southern half of United States and south to Costa Rica.

Habits and economic status: The prairies of the upper Mississippi Valley, with their numerous sloughs and ponds, furnish ideal nesting places for redwings, and consequently this region has become the great breeding ground for the species. These prairies pour forth the vast flocks that play havoc with grainfields. East of the Appalachian Range, marshes on the shores of lakes, rivers, and estuaries are the only available breeding sites and, as these are comparatively few and small, the species is much less abundant than in the West. Redwings are eminently gregarious, living in flocks and breeding in communities. The food of the redwing consists of 27 per cent animal matter and 73 per cent vegetable. Insects constitute practically one-fourth of the food. Beetles (largely weevils, a most harmful group) amount to 10 per cent. Grasshoppers are eaten in every month and amount to about 5 per cent. Caterpillars (among them the injurious army worm) are eaten at all seasons and aggregate 6 per cent. Ants, wasps, bugs, flies, dragonflies, and spiders also are eaten. The vegetable food consists of seeds, including grain, of which oats is the favorite, and some small fruits. When in large flocks this bird is capable of doing great harm to grain. (See Biol. Survey Bul. 13, pp. 33–34.)

BOBOLINK (Dolichonyx oryzivorus).

Length, about 7 inches.

Range: Breeds from Ohio northeast to Nova Scotia, north to Manitoba, and northwest to British Columbia; winters in South America.

Habits and economic status: When American writers awoke to the beauty and attractiveness of our native birds, among the first to be enshrined in song and story was the bobolink. Few species show such striking contrasts in the color of the sexes, and few have songs more unique and whimsical. In its northern home the bird is loved for its beauty and its rich melody; in the South it earns deserved hatred by its destructiveness. Bobolinks reach the southeastern coast of the United States the last half of April just as rice is sprouting and at once begin to pull up and devour the sprouting kernels. Soon they move on to their northern breeding grounds, where they feed upon insects, weed seeds, and a little grain. When the young are well on the wing, they gather in flocks with the parent birds and gradually move southward, being then generally known as reed birds. They reach the rice fields of the Carolinas about August 20, when the rice is in the milk. Then until the birds depart for South America planters and birds fight for the crop, and in spite of constant watchfulness and innumerable devices for scaring the birds a loss of 10 per cent of the rice is the usual result. (See Biol. Survey Bul. 13, pp. 12–22.)

COMMON CROW (Corvus brachyrhynchos).

Length, 19 inches.

Range: Breeds throughout the United States and most of Canada; winters generally in the United States.

Habits and economic status: The general habits of the crow are universally known. Its ability to commit such misdeeds as pulling corn and stealing eggs and fruit and to get away unscathed is little short of marvelous. Much of the crow's success in life is due to cooperation, and the social instinct of the species has its highest expression in the winter roosts, which are sometimes frequented by hundreds of thousands of crows. From these roosts daily flights of many miles are made in search of food. Injury to sprouting corn is the most frequent complaint against this species, but by coating the seed grain with coal tar most of this damage may be prevented. Losses of poultry and eggs may be averted by proper housing and the judicious use of wire netting. The insect food of the crow includes wireworms, cutworms, white grubs, and grasshoppers, and during outbreaks of these insects the crow renders good service. The bird is also an efficient scavenger. But chiefly because of its destruction of beneficial wild birds and their eggs the crow must be classed as a criminal, and a reduction in its numbers in localities where it is seriously destructive is justifiable. (See Farmers' Bul. 54, pp. 22–23.)

CALIFORNIA JAY (Aphelocoma californica).

Length, 12 inches. Distinguished from other jays within its range by its decidedly whitish underparts and brown patch on the back.

Range: Resident in California, north to southern Washington, and south to southern Lower California.

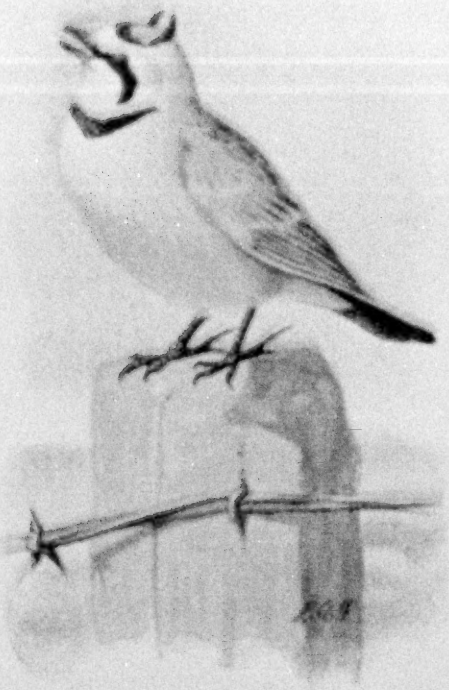
Habits and economic status: This jay has the same general traits of character as the eastern blue jay. He is the same noisy, rollicking fellow and occupies a corresponding position in bird society. Robbing the nests of smaller birds is a favorite pastime, and he is a persistent spy upon domestic fowls and well knows the meaning of the cackle of a hen. Not only does he steal eggs but he kills young chicks. The insect food of this jay constitutes about one-tenth of its annual sustenance. The inclusion of grasshoppers and caterpillars makes this part of the bird's food in its favor. But the remainder of its animal diet includes altogether too large a proportion of beneficial birds and their eggs, and in this respect it appears to be worse than its eastern relative, the blue jay. While its vegetable food is composed largely of mast, at times its liking for cultivated fruit and grain makes it a most unwelcome visitor to the orchard and farm. In conclusion it may be said that over much of its range this jay is too abundant for the best interests of agriculture and horticulture. (See Biol. Survey Bul. 34, pp. 50-56.)

BLUE JAY (Cyanocitta cristata).

Length, 11½ inches. The brilliant blue of the wings and tail combined with the black crescent of the upper breast and the crested head distinguish this species.

Range: Resident in the eastern United States and southern Canada, west to the Dakotas, Colorado, and Texas.

Habits and economic status: The blue jay is of a dual nature. Cautious and silent in the vicinity of its nest, away from it it is bold and noisy. Sly in the commission of mischief, it is ever ready to scream "thief" at the slightest disturbance. As usual in such cases, its remarks are applicable to none more than itself, a fact neighboring nest holders know to their sorrow, for during the breeding season the jay lays heavy toll upon the eggs and young of other birds, and in doing so deprives us of the services of species more beneficial than itself. Approximately three-fourths of the annual food of the blue jay is vegetable matter, the greater part of which is composed of mast, i. e., acorns, chestnuts, beechnuts, and the like. Corn is the principal cultivated crop upon which this bird feeds, but stomach analysis indicates that most of the corn taken is waste grain. Such noxious insects as wood-boring beetles, grasshoppers, eggs of various caterpillars, and scale insects constitute about one-fifth of its food. (See Farmers' Bul. 54, pp. 18–19.)



HORNED LARK (Otocoris alpestris).

Length, about 7¼ inches. The black mark across the breast and the small, pointed tufts of dark feathers above and behind the eyes distinguish the bird.

Range: Breeds throughout the United States (except the South Atlantic and Gulf States) and Canada; winters in all the United States except Florida.

Habits and economic status: Horned larks frequent the open country, especially the plains and deserts. They associate in large flocks, are hardy, apparently delighting in exposed situations in winter, and often nest before snow disappears. The flight is irregular and hesitating, but in the breeding season the males ascend high in air, singing as they go, and pitch to the ground in one thrilling dive. The preference of horned larks is for vegetable food, and about one-sixth of this is grain, chiefly waste. Some sprouting grain is pulled, but drilled grain is safe from injury. California horned larks take much more grain than the eastern birds, specializing on oats, but this is accounted for by the fact that oats grow wild over much of the State. Weed seeds are the largest single element of food. The insect food, about 20 per cent of the whole, includes such pests as May beetles and their larvæ (white grubs), leaf beetles, clover-leaf and clover-root weevils, the potato-stalk borer, nut weevils, billbugs, and the chinch bug. Grasshoppers are a favorite food, and cutworms are freely eaten. The horned larks, on the whole, may be considered useful birds. (See Biol. Survey Bul. 23.)

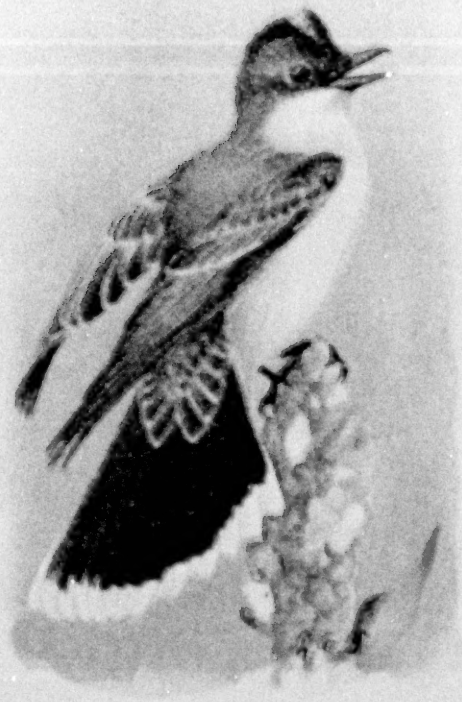
ARKANSAS KINGBIRD (Tyrannus verticalis).

Length, 9 inches. The white edge of the feather on each side of the tail distinguishes this from all other flycatchers except the gray and salmon-colored scissortail of Texas.

Range: Breeds from Minnesota, Kansas, and Texas to the Pacific Ocean and from northern Mexico to southern Canada; winters from Mexico to Guatemala.

Habits and economic status: The Arkansas kingbird is not so domestic as its eastern relative and seems to prefer the hill country with scattered oaks rather than the orchard or the vicinity of ranch buildings, but it sometimes places its rude and conspicuous nest in trees on village streets. The bird's yearly food is composed of 87 per cent animal matter and 13 per cent vegetable. The animal food is composed almost entirely of insects. Like the eastern species, it has been accused of destroying honeybees to a harmful extent, and remains of honeybees were found to constitute 5 per cent of the food of the individuals examined, but nearly all those eaten were drones. Bees and wasps, in general, are the biggest item of food (38 per cent), grasshoppers and crickets stand next (20 per cent), and beetles, mostly of noxious species, constitute 14 per cent of the food. The vegetable food consists mostly of fruit, such as the elder and other berries, with a few seeds. This bird should be strictly preserved. (See Biol. Survey Bul. 34, pp. 32–34, and Bul. 44, pp. 19–22.)

KINGBIRD (Tyrannus tyrannus).



Length, about 8½ inches. The white lower surface and white-tipped tail distinguish this flycatcher.

Range: Breeds throughout the United States (except the southwestern part) and southern Canada; winters from Mexico to South America.

Habits and economic status: The kingbird is a pronounced enemy of hawks and crows, which it vigorously attacks at every opportunity, thereby affording efficient protection to near-by poultry yards and young chickens at large. It loves the open country and is especially fond of orchards and trees about farm buildings. No less than 85 per cent of its food consists of insects, mostly of a harmful nature. It eats the common rose chafer or rose bug, and more remarkable still it devours blister beetles freely. The bird has been accused of eating honeybees to an injurious extent, but there is little ground for the accusation, as appears from the fact that examination of 634 stomachs showed only 61 bees in 22 stomachs. Of these 51 were useless drones. On the other hand, it devours robber flies, which catch and destroy honeybees. Grasshoppers and crickets, with a few bugs and some cutworms, and a few other insects, make up the rest of the animal food. The vegetable food consists of fruit and a few seeds. The kingbird deserves full protection. (See Biol. Surv. Bul. 44, pp. 11–19.)

NIGHTHAWK (Chordeiles virginianus).

Length, 10 inches. Not to be confused with the whippoorwill. The latter lives in woodland and is chiefly nocturnal. The nighthawk often flies by day, when the white bar across the wing and its nasal cry are distinguishing.

Range: Breeds throughout most of the United States and Canada; winters in South America.

Habits and economic status: The skillful evolutions of a company of nighthawks as the birds gracefully cleave the air in intersecting circles is a sight to be remembered. So expert are they on the wing that no insect is safe from them, even the swift dragonfly being captured with ease. Unfortunately their erratic flight tempts men to use them for targets, and this inexcusable practice is seriously diminishing their numbers, which is deplorable, since no birds are more useful. This species makes no nest, but lays its two spotted eggs on the bare ground, sometimes on the gravel roof of the city house. The nighthawk is a voracious feeder and is almost exclusively insectivorous. Some stomachs contained from 30 to 50 different kinds of insects, and more than 600 kinds have been identified from the stomachs thus far examined. From 500 to 1,000 ants are often found in a stomach. Several species of mosquitoes, including *Anopheles*, the transmitter of malaria, are eaten. Other well-known pests destroyed by the nighthawk are the Colorado potato beetle, cucumber beetles, chestnut, rice, clover-leaf and cotton-boll weevils, billbugs, bark beetles, squash bugs, and moths of the cotton worm.

FLICKER (Colaptes auratus).

Length, 13 inches. The yellow under surface of the wing, yellow tail shafts, and white rump are characteristic.

Range: Breeds in the eastern United States west to the plains and in the forested parts of Canada and Alaska; winters in most of the eastern United States.

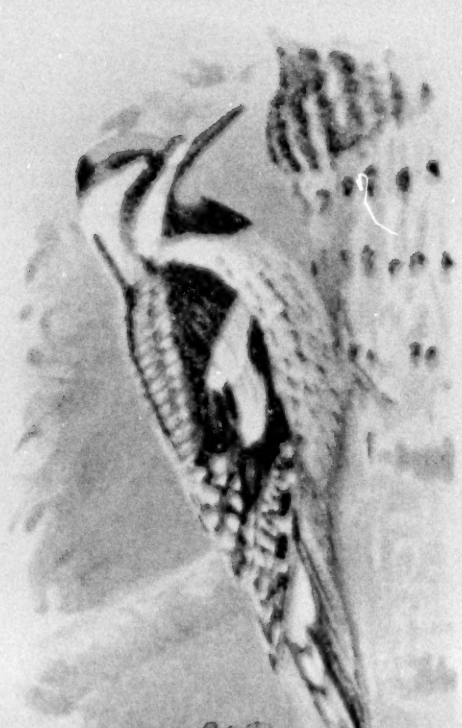
Habits and economic status: The flicker inhabits the open country rather than the forest and delights in park-like regions where trees are numerous and scattered. It nests in any large cavity in a tree and readily appropriates an artificial box. It is possible, therefore, to insure the presence of this useful bird about the farm and to increase its numbers. It is the most terrestrial of our woodpeckers and procures much of its food from the ground. The largest item of animal food is ants, of which the flicker eats more than any other common bird. Ants were found in 524 of the 684 stomachs examined and 98 stomachs contained no other food. One stomach contained over 5,000 and two others held over 3,000 each. While bugs are not largely eaten by the flicker, one stomach contained 17 chinch bugs. Wild fruits are next to ants in importance in the flicker's dietary. Of these sour gum and wild black cherry stand at the head. The food habits of this bird are such as to recommend it to complete protection. (See Biol. Survey Bul. 37, pp. 52–58.)

YELLOW-BELLIED SAPSUCKER (Sphyrapicus varius).

Length, about 8½ inches. Only woodpecker having top of head from base of bill red, combined with a black patch on breast.

Range: Breeds in northern half of the United States and southern half of Canada; winters in most of the States and south to Costa Rica.

Habits and economic status: The yellow-bellied sapsucker is rather silent and suspicious and generally manages to have a tree between himself and the observer. Hence the bird is much better known by its works than its appearance. The regular girdles of holes made by this bird are common on a great variety of trees; in all about 250 kinds are known to be attacked. Occasionally young trees are killed outright, but more loss is caused by stains and other blemishes in the wood which result from sapsucker punctures. These blemishes, which are known as bird pecks, are especially numerous in hickory, oak, cypress, and yellow poplar. Defects due to sapsucker work cause an annual loss to the lumber industry estimated at $1,250,000. The food of the yellow-bellied sapsucker is about half animal and half vegetable. Its fondness for ants counts slightly in its favor. It eats also wasps, beetles (including, however, very few wood-boring species), bugs, and spiders. The two principal components of the vegetable food are wild fruits of no importance and cambium (the layer just beneath the bark of trees). In securing the cambium the bird does the damage above described. The yellow-bellied sapsucker, unlike other woodpeckers, thus does comparatively little good and much harm. (See Biol. Survey Bul. 39.)



DOWNY WOODPECKER (Dryobates pubescens).

Length, 6 inches. Our smallest woodpecker; spotted with black and white. Dark bars on the outer tail feathers distinguish it from the similarly colored but larger hairy woodpecker.

Range: Resident in the United States and the forested parts of Canada and Alaska.

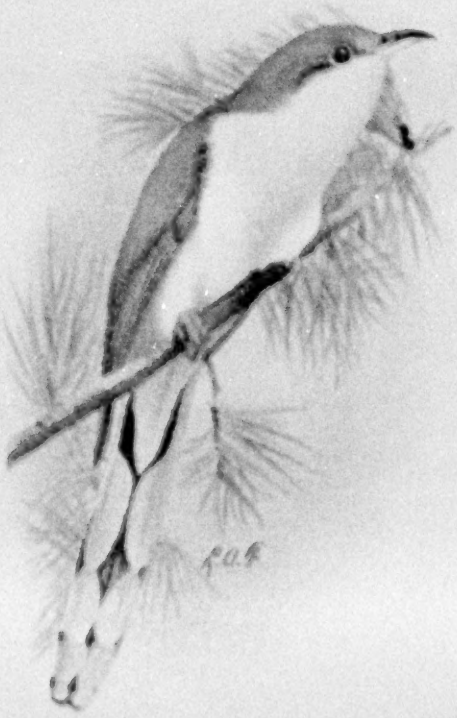
Habits and economic status: This woodpecker is commonly distributed, living in woodland tracts, orchards, and gardens. The bird has several characteristic notes, and, like the hairy woodpecker, is fond of beating on a dry resonant tree branch a tattoo which to appreciative ears has the quality of woodland music. In a hole excavated in a dead branch the downy woodpecker lays four to six eggs. This and the hairy woodpecker are among our most valuable allies, their food consisting of some of the worst foes of orchard and woodland, which the woodpeckers are especially equipped to dig out of dead and living wood. In the examination of 723 stomachs of this bird, animal food, mostly insects, was found to constitute 76 per cent of the diet and vegetable matter 24 per cent. The animal food consists largely of beetles that bore into timber or burrow under the bark. Caterpillars amount to 16 per cent of the food and include many especially harmful species. Grasshopper eggs are freely eaten. The vegetable food of the downy woodpecker consists of small fruit and seeds, mostly of wild species. It distributes seeds of poison ivy, or poison oak, which is about the only fault of this very useful bird. (See Biol. Survey Bul. 37, pp. 17–22.)

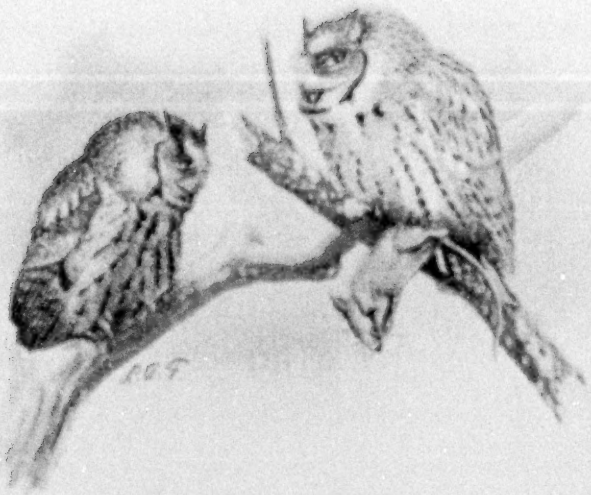
YELLOW-BILLED CUCKOO (Coccyzus americanus).

Length, about 12 inches. The yellow lower part of the bill distinguishes this bird from its near relative, the black-billed cuckoo.

Range: Breeds generally in the United States and southern Canada; winters in South America.

Habits and economic status: This bird lives on the edges of woodland, in groves, orchards, parks, and even in shaded village streets. It is sometimes known as rain crow, because its very characteristic notes are supposed to foretell rain. The cuckoo has sly, furtive ways as it moves among the bushes or flits from tree to tree, and is much more often seen than heard. Unlike its European relative, it does not lay its eggs in other birds' nests, but builds a nest of its own. This is, however, a rather crude and shabby affair—hardly more than a platform of twigs sufficient to hold the greenish eggs. The cuckoo is extremely useful because of its insectivorous habits, especially as it shows a marked preference for the hairy caterpillars, which few birds eat. One stomach that was examined contained 250 American tent caterpillars; another, 217 fall webworms. In places where tent caterpillars are abundant they seem to constitute a large portion of the food of this and the black-billed cuckoo.





SCREECH OWL (Otus asio).

Length, about 8 inches. Our smallest owl with ear tufts. There are two distinct phases of plumage, one grayish and the other bright rufous.

Range: Resident throughout the United States, southern Canada, and northern Mexico.

Habits and economic status: The little screech owl inhabits orchards, groves, and thickets, and hunts for its prey in such places as well as along hedgerows and in the open. During warm spells in winter it forages quite extensively and stores up in some hollow tree considerable quantities of food for use during inclement weather. Such larders frequently contain enough mice or other prey to bridge over a period of a week or more. With the exception of the burrowing owl it is probably the most insectivorous of the nocturnal birds of prey. It feeds also upon small mammals, birds, reptiles, batrachians, fish, spiders, crawfish, scorpions, and earthworms. Grasshoppers, crickets, ground-dwelling beetles, and caterpillars are its favorites among insects, as are field mice among mammals and sparrows among birds. Out of 324 stomachs examined, 169 were found to contain insects; 142, small mammals; 56, birds; and 15, crawfish. The screech owl should be encouraged to stay near barns and outhouses, as it will keep in check house mice and wood mice, which frequent such places. (See Biol. Survey Bul. 3, pp. 163-173.)

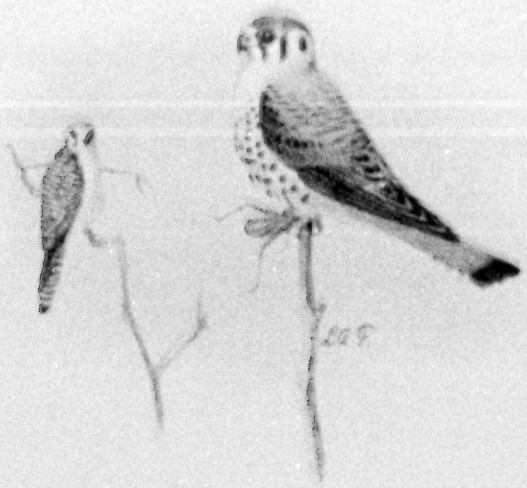
BARN OWL (Aluco pratincola).

Length, about 17 inches. Facial disk not circular as in our other owls; plumage above, pale yellow; beneath, varying from silky white to pale bright tawny.

Range: Resident in Mexico, in the southern United States, and north to New York, Ohio, Nebraska, and California.

Habits and economic status: The barn owl, often called monkey-faced owl, is one of the most beneficial of the birds of prey, since it feeds almost exclusively on small mammals that injure farm produce, nursery, and orchard stock. It hunts principally in the open and consequently secures such mammals as pocket gophers, field mice, common rats, house mice, harvest mice, kangaroo rats, and cotton rats. It occasionally captures a few birds and insects. At least a half bushel of the remains of pocket gophers have been found in the nesting cavity of a pair of these birds. Remembering that a gopher has been known in a short time to girdle seven apricot trees worth $100 it is hard to overestimate the value of the service of a pair of barn owls. 1,247 pellets of the barn owl collected from the Smithsonian towers contained 3,100 skulls, of which 3,004, or 97 per cent, were of mammals; 92, or 3 per cent, of birds; and 4 were of frogs. The bulk consisted of 1,987 field mice, 656 house mice, and 210 common rats. The birds eaten were mainly sparrows and blackbirds. This valuable owl should be rigidly protected throughout its entire range. (See Biol. Survey Bul. 3, pp. 132-139.)

SPARROW HAWK (Falco sparverius).



Length, about 10 inches. This is one of the best known and handsomest, as well as the smallest, of North American hawks.

Range: Breeds throughout the United States, Canada, and northern Mexico; winters in the United States and south to Guatemala.

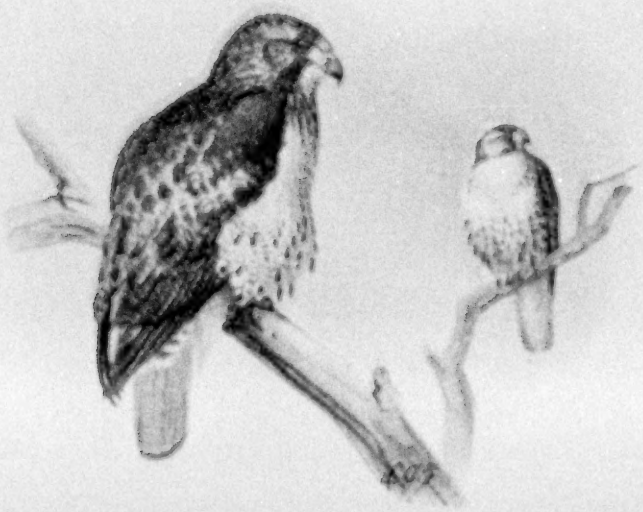
Habits and economic status: The sparrow hawk, which is a true falcon, lives in the more open country and builds its nest in hollow trees. It is abundant in many parts of the West, where telegraph poles afford it convenient perching and feeding places. Its food consists of insects, small mammals, birds, spiders, and reptiles. Grasshoppers, crickets, and terrestrial beetles and caterpillars make up considerably more than half its subsistence, while field mice, house mice, and shrews cover fully 25 per cent of its annual supply. The balance of the food includes birds, reptiles, and spiders. Contrary to the usual habits of the species, some individuals during the breeding season capture nestling birds for food for their young and create considerable havoc among the songsters of the neighborhood. In agricultural districts when new ground is broken by the plow, they sometimes become very tame, even alighting for an instant under the horses in their endeavor to seize a worm or insect. Out of 410 stomachs examined, 314 were found to contain insects; 129, small mammals; and 70, small birds. This little falcon renders good service in destroying noxious insects and rodents and should be encouraged and protected. (See Biol. Survey Bul. 3, pp. 115–127.)

RED-TAILED HAWK (Buteo borealis).

Length, about 2 feet. One of our largest hawks; adults with tail reddish brown.

Range: Breeds in the United States, Mexico, Costa Rica, Canada, and Alaska; winters generally in the United States and south to Guatemala.

Habits and economic status: The red-tailed hawk, or "hen-hawk," as it is commonly called, is one of the best known of all our birds of prey, and is a widely distributed species of great economic importance. Its habit of sitting on some prominent limb or pole in the open, or flying with measured wing beat over prairies and sparsely wooded areas on the lookout for its favorite prey, causes it to be noticed by the most indifferent observer. Although not as omnivorous as the red-shouldered hawk, it feeds on a variety of food, as small mammals, snakes, frogs, insects, birds, crawfish, centipedes, and even carrion. In regions where rattlesnakes abound it destroys considerable numbers of the reptiles. Although it feeds to a certain extent on poultry and birds, it is nevertheless entitled to general protection on account of the insistent warfare it wages against field mice and other small rodents and insects that are so destructive to young orchards, nursery stock, and farm produce. Out of 530 stomachs examined, 457, or 85 per cent, contained the remains of mammal pests such as field mice, pine mice, rabbits, several species of ground squirrels, pocket gophers, and cotton rats, and only 62 contained the remains of poultry or game birds. (See Biol. Survey Bul 3, pp. 48–62.)



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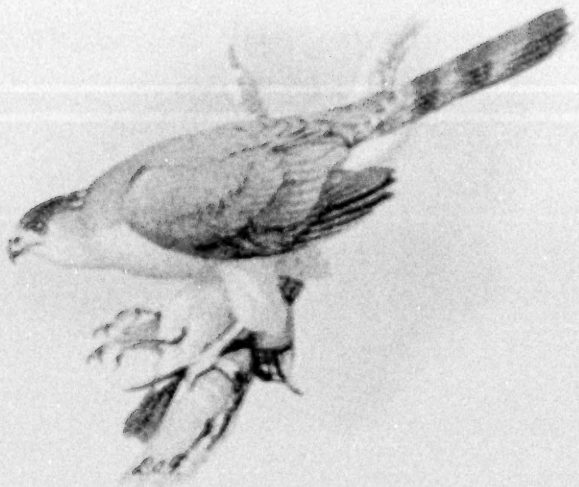


COOPER'S HAWK (Accipiter cooperi).

Length, about 15 inches. Medium sized, with long tail and short wings, and without the white patch on rump which is characteristic of the marsh hawk.

Range: Breeds throughout most of the United States and southern Canada; winters from the United States to Costa Rica.

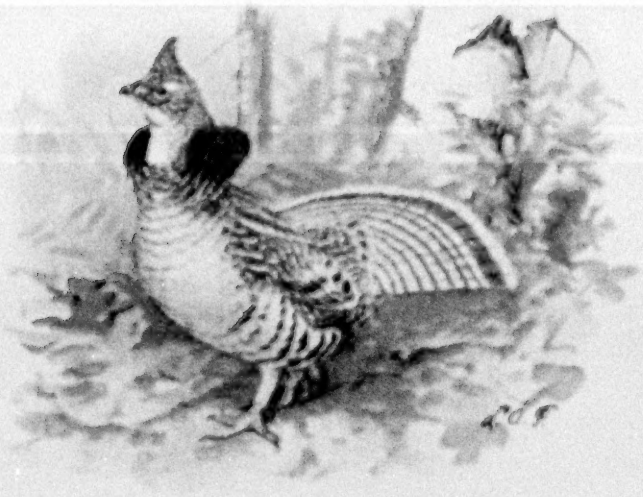
Habits and economic status: The Cooper's hawk, or "blue darter," as it is familiarly known throughout the South, is preeminently a poultry and bird-eating species, and its destructiveness in this direction is surpassed only by that of its larger congener, the goshawk, which occasionally in autumn and winter enters the United States from the North in great numbers. The almost universal prejudice against birds of prey is largely due to the activities of these two birds, assisted by a third, the sharp-shinned hawk, which in habits and appearance might well pass for a small Cooper's hawk. These birds usually approach under cover and drop upon unsuspecting victims, making great inroads upon poultry yards and game coverts favorably situated for this style of hunting. Out of 123 stomachs examined, 38 contained the remains of poultry and game birds, 66 the remains of other birds, and 12 the remains of mammals. Twenty-eight species of wild birds were identified in the above-mentioned material. This destructive hawk, together with its two near relatives, should be destroyed by every possible means. (See Biol. Survey Bul. 3, pp. 38–43.)

MOURNING DOVE (Zenaidura macroura).

Length, 12 inches. The dark spot on the side of the neck distinguishes this bird from all other native doves and pigeons except the white-winged dove. The latter has the upper third of wing white.

Range: Breeds throughout the United States and in Mexico, Guatemala, and southern Canada; winters from the central United States to Panama.

Habits and economic status: The food of the mourning dove is practically all vegetable matter (over 99 per cent), principally seeds of plants, including grain. Wheat, oats, rye, corn, barley, and buckwheat were found in 150 out of 237 stomachs, and constituted 32 per cent of the food. Three-fourths of this was waste grain picked up after harvest. The principal and almost constant diet is weed seeds, which are eaten throughout the year and constitute 64 per cent of the entire food. In one stomach were found 7,500 seeds of yellow wood sorrel, in another 6,400 seeds of barn grass or foxtail, and in a third 2,600 seeds of slender paspalum, 4,820 of orange hawkweed, 950 of hoary vervain, 120 of Carolina cranesbill, 50 of yellow wood sorrel, 620 of panic grass, and 40 of various other weeds. None of these are useful, and most of them are troublesome weeds. The dove does not eat insects or other animal food. It should be protected in every possible way. (See Farmers' Bul. 54, pp. 6–7.)



RUFFED GROUSE (Bonasa umbellus).

Length, 17 inches. The broad black band near tip of tail distinguishes this from other grouse.

Range: Resident in the northern two-thirds of the United States and in the forested parts of Canada.

Habits and economic status: The ruffed grouse, the famed drummer and finest game bird of the northern woods, is usually wild and wary and under reasonable protection well withstands the attacks of hunters. Moreover, when reduced in numbers, it responds to protection in a gratifying manner and has proved to be well adapted to propagation under artificial conditions. Wild fruits, mast, and browse make up the bulk of the vegetable food of this species. It is very fond of hazelnuts, beechnuts, chestnuts, and acorns, and it eats practically all kinds of wild berries and other fruits. Nearly 60 kinds of fruits have been identified from the stomach contents examined. Various weed seeds also are consumed. Slightly more than 10 per cent of the food consists of insects, about half being beetles. The most important pests devoured are the potato beetle, clover-root weevil, the pale-striped flea beetle, grapevine leaf-beetle, May beetles, grasshoppers, cotton worms, army worms, cutworms, the red-humped apple worm, and sawfly larvæ. While the economic record of the ruffed grouse is fairly commendable, it does not call for more stringent protection than is necessary to maintain the species in reasonable numbers. (See Biol. Survey Bul. 24, pp. 25–38.)

BOBWHITE (Colinus virginianus).

Length, 10 inches. Known everywhere by the clear whistle that suggests its name.

Range: Resident in the United States east of the plains; introduced in many places in the West.

Habits and economic status: The bobwhite is loved by every dweller in the country and is better known to more hunters in the United States than any other game bird. It is no less appreciated on the table than in the field, and in many States has unquestionably been hunted too closely. Fortunately it seems to be practicable to propagate the bird in captivity, and much is to be hoped for in this direction. Half the food of this quail consists of weed seeds, almost a fourth of grain, and about a tenth of wild fruits. Although thus eating grain, the bird gets most of it from stubble. Fifteen per cent of the bobwhite's food is composed of insects, including several of the most serious pests of agriculture. It feeds freely upon Colorado potato beetles and chinch bugs; it devours also cucumber beetles, wireworms, billbugs, clover-leaf weevils, cotton-boll weevils, army worms, bollworms, cutworms, and Rocky Mountain locusts. Take it all in all, bobwhite is very useful to the farmer, and while it may not be necessary to remove it from the list of game birds every farmer should see that his own farm is not depleted by eager sportsmen. (See Biol. Survey Bul. 21, pp. 9–46.)

KILLDEER (Oxyechus vociferus).

Length, 10 inches. Distinguished by its piercing and oft-repeated cry—*killdee*.

Range: Breeds throughout the United States and most of Canada; winters from central United States to South America.

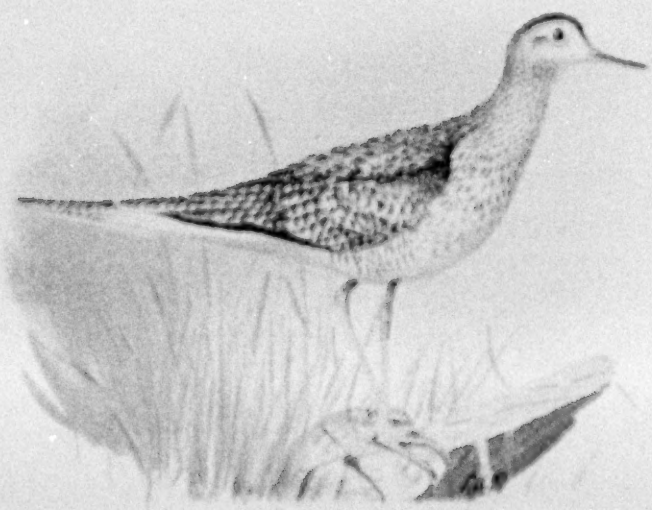
Habits and economic status: The killdeer is one of the best known of the shorebird family. It often visits the farmyard and commonly nests in pastures or cornfields. It is rather suspicious, however, and on being approached takes flight with loud cries. It is noisy and restless, but fortunately most of its activities result in benefit to man. The food is of the same general nature as that of the upland plover, but is more varied. The killdeer feeds upon beetles, grasshoppers, caterpillars, ants, bugs, caddis flies, dragonflies, centipedes, spiders, ticks, oyster worms, earthworms, snails, crabs, and other crustacea. Among the beetles consumed are such pests as the alfalfa weevil, cotton-boll weevil, clover-root weevil, clover-leaf weevil, pine weevil, billbugs, white grubs, wireworms, and leaf beetles. The bird also devours cotton worms, cotton cutworms, horse-flies, mosquitoes, cattle ticks, and crawfish. One stomach contained hundreds of larvæ of the saltmarsh mosquito, one of the most troublesome species. The killdeer preys extensively upon insects that are annoying to man and injurious to his stock and crops, and this should be enough to remove it from the list of game birds and insure its protection. (See Farmers' Bul. 497, pp. 16–18.)

UPLAND PLOVER (Bartramia longicauda).

Length, 12 inches. The only plainly colored shorebird which occurs east of the plains and inhabits exclusively dry fields and hillsides.

Range: Breeds from Oregon, Utah, Oklahoma, Indiana, and Virginia, north to Alaska; winters in South America.

Habits and economic status: This, the most terrestrial of our waders, is shy and wary, but it has the one weakness of not fearing men on horseback or in a vehicle. One of these methods of approach, therefore, is nearly always used by the sportsman, and, since the bird is highly prized as a table delicacy, it has been hunted to the verge of extermination. As the upland plover is strictly beneficial, it should no longer be classed as a game bird and allowed to be shot. Ninety-seven per cent of the food of this species consists of animal forms, chiefly of injurious and neutral species. The vegetable food is mainly weed seeds. Almost half of the total subsistence is made up of grasshoppers, crickets, and weevils. Among the weevils eaten are the cotton-boll weevil, greater and lesser clover-leaf weevils, cowpea weevils, and billbugs. This bird devours also leaf beetles, wireworms, white grubs, army worms, cotton worms, cotton cutworms, sawfly larvæ, horse-flies, and cattle ticks. In brief, it injures no crop, but consumes a host of the worst enemies of agriculture. (See Farmers' Bul. 497, pp. 14–16.)



BLACK TERN (Hydrochelidon nigra surinamensis).

Length, 10 inches. In autumn occurs as a migrant on the east coast of the United States, and then is in white and gray plumage. During the breeding season it is confined to the interior, is chiefly black, and is the only dark tern occurring inland.

Range: Breeds from California, Colorado, Missouri, and Ohio, north to central Canada; winters from Mexico to South America; migrant in the eastern United States.

Habits and economic status: This tern, unlike most of its relatives, passes much of its life on fresh-water lakes and marshes of the interior. Its nests are placed among the tules and weeds, on floating vegetation, or on muskrat houses. It lays from 2 to 4 eggs. Its food is more varied than that of any other tern. So far as known it preys upon no food fishes, but feeds extensively upon such enemies of fish as dragonfly nymphs, fish-eating beetles, and crawfishes. Unlike most of its family, it devours a great variety of insects, many of which it catches as it flies. Dragonflies, May flies, grasshoppers, predaceous diving beetles, scarabæid beetles, leaf beetles, gnats, and other flies are the principal kinds preyed upon. Fishes of little economic value, chiefly minnows and mummichogs, were found to compose only a little more than 19 per cent of the contents of 145 stomachs. The great consumption of insects by the black tern places it among the beneficial species worthy of protection.

FRANKLIN'S GULL (Larus franklini).

Length, 15 inches. During its residence in the United States Franklin's gull is practically confined to the interior and is the only inland gull with black head and red bill.

Range: Breeds in the Dakotas, Iowa, Minnesota, and the neighboring parts of southern Canada; winters from the Gulf Coast to South America.

Habits and economic status: Nearly all of our gulls are coast-loving species and spend comparatively little of their time in fresh water, but Franklin's is a true inland gull. Extensive marshes bordering shallow lakes are its chosen breeding grounds, and as many such areas are being reclaimed for agricultural purposes it behooves the tillers of the soil to protect this valuable species. When undisturbed this gull becomes quite fearless and follows the plowman to gather the grubs and worms from the newly turned furrows. It lives almost exclusively upon insects, of which it consumes great quantities. Its hearty appetite is manifest from the contents of a few stomachs: A, 327 nymphs of dragonflies; B, 340 grasshoppers, 52 bugs, 3 beetles, 2 wasps, and 1 spider; C, 82 beetles, 87 bugs, 984 ants, 1 cricket, 1 grasshopper, and 2 spiders. About four-fifths of the total food is grasshoppers, a strong point in favor of this bird. Other injurious creatures eaten are billbugs, squash bugs, leafhoppers, click beetles (adults of wireworms), May beetles (adults of white grubs), and weevils. Franklin's gull is probably the most beneficial bird of its group. (See Farmers' Bul. 497, pp. 19–22.)

OUR POLICEMEN OF THE AIR

NO ONE can read the preceding pages without an immediate desire to become personally acquainted with each of the handsome creatures pictured. How indefatigably the wrens, swallows, nighthawks, owls, red-tailed hawks, etc., are working to lighten our labors on the farm and orchard.

Birds are our best friends. They are our most efficient allies in the incessant warfare that must be waged by man against insect pests. Notwithstanding our efforts, insects are not diminishing in number, but in many localities are increasing. What would happen were birds exterminated no one can foretell with absolute certainty, but it is almost certain, says Dr. Henshaw, that within a limited time not only would it be impossible to grow fruits and grain, but the greater part of our vegetation would be destroyed.* The more carefully birds' habits are studied and their food investigated, the more apparent it is that man cannot do without them.

Pages 669-697 are an admirable illustration of the educational work conducted by our U. S. Biological Survey. The temptation to shoot a hawk or owl, perching or flying, which now is almost irresistible to many, will soon disappear when the man with the gun realizes that he is seeking to put a friend to death.

But the Biological Survey does not confine its studies to birds alone; it also helps to protect us against four-footed pests. Its experts have shown how wolves, which in recent years have become very numerous and destructive on cattle and sheep ranges, may be destroyed by poison, and it has recommended measures which, if energetically and persistently pursued, will probably result in the practical extermination of these savage animals. In some sections of the United States the damage by meadow and house mice, by prairie dogs, rats, gophers, ground squirrels, and other small gnawing animals amounts to millions of dollars a year. One of the small ground squirrels of Washington State injures the wheat crop in a single county of that State to the extent of half a million dollars annually. The Survey men are successfully devising a method to destroy these pests, and thus relieve this serious drain on the farm.

An important duty of the Biological Survey is to prevent the entrance into the United States of undesirable bird or animal immigrants. "The English sparrow serves as an ever-ready example of the disastrous consequences of the unwise introduction of a species into a new home. Under the present law and system of inspection, this pest could never have obtained a foothold in America, since so well known were the bird's habits in its native land that its disastrous career on this continent would have been foreseen and its entry prohibited.

"Under the mistaken idea that the mongoose would prove beneficial by devoting itself to the destruction of small rodents, and ignorant of the fact that the animal is omnivorous and one of the most destructive creatures in existence, more than one attempt has been made to import it into the United States, where its successful introduction would prove nothing less than a national calamity."

On pages 669-697 references are made to other publications of the Biological Survey. Several of them are out of print, but the majority may be obtained by persons desiring further information by applying to the Superintendent of Documents, Washington, D. C., and inclosing the price of the bulletins desired.

Farmers' Bulletin 54 and 497, each	$0.05
Biological Survey Bulletins 9, 13, 23, each	.05
Biological Survey Bulletin 15	.10
Biological Survey Bulletin 21	.15
Biological Survey Bulletins 30 and 44, each	.20
Biological Survey Bulletin 32	.25
Biological Survey Bulletin 34	.40
Biological Survey Bulletin 39	.30
Biological Survey Bulletin 37	.35
Yearbook, Department of Agriculture, 1895	.55

Biological Survey Bulletins 3 and 24 are out of print and cannot be supplied.

* See "Policemen of the Air," by Henry W. Henshaw, in the NATIONAL GEOGRAPHIC MAGAZINE, February, 1908.

BIRDS MAY BRING YOU MORE HAPPINESS THAN THE WEALTH OF THE INDIES

By Frank M. Chapman

The following article is reprinted from "Bird Life," a most useful guide to the study of our common birds, by Frank M. Chapman, illustrated by 75 full-page colored plates after drawings by Ernest Seton Thompson. Mr. Chapman is Curator of Ornithology in the American Museum of Natural History; author of "Handbook of Birds of Eastern North America," "The Warblers of North America," "Bird Studies with the Camera," "Camps and Cruises of an Ornithologist," and editor of "Bird Lore."

BIRDS possess unusual claims to our attention. They are practically the only ones of the higher animals with which we may come in contact daily. Our large mammals have either been exterminated or driven from the vicinity of our homes, while most of the smaller species are nocturnal and therefore rarely seen. Reptiles and batrachians are difficult to observe and are not popular, while fishes, from the nature of their haunts, can be studied only under certain conditions. Birds, however, are everywhere—in field and wood and sky, in our orchards and gardens—and some of them are with us at all seasons.

But birds' merits do not consist merely in their abundance. In beauty of plumage, grace of motion, and vocal ability they are without rivals; in their migration, mating, and nesting habits they not only display unusual intelligence, but exhibit human traits of character that create within us a feeling of kinship with them, and thus increase our interest in and love for them. Furthermore, as with increasing knowledge we begin to realize their economic value, we are more than ever impressed with the importance of becoming acquainted with them.

How unusual it is to meet any one who can correctly name a dozen of our birds! One may live in the country and still know only two or three of the one hundred and fifty or more kinds of birds that may be found during the year. Nevertheless, these gay, restless creatures, both by voice and action, constantly invite our attention, and they are far too interesting and beautiful to be ignored. No one to whom Nature appeals should be without some knowledge of these, the most attractive of her animate forms.

An inherent love of birds is an undeniable psychological fact, which finds its most frequent expression in the general fondness for cage-birds. If we can learn to regard the birds of the woods and fields with all the affection we lavish on our poor captives in their gilded homes, what an inexhaustible store of enjoyment is ours!

It is not alone the beauty, power of song, or intelligence of birds which attracts us; it is their human attributes. Man exhibits hardly a trait which he will not find reflected in the life of a bird. Love, hate; courage, fear; anger, pleasure; vanity, modesty; virtue, vice; constancy, fickleness; generosity, selfishness; wit, curiosity, memory, reason—we may find them all exhibited in the lives of birds.

Birds have thus become symbolic of certain human characteristics, and the more common species are so interwoven in our art and literature that by name at least they are known to all of us. Shakespeare makes over six hundred references to birds or bird-life. If we should rob Wordsworth's verses of their birds, how sadly mutilated what remained would be!

THE NEVER FAILING CHARM OF THE BIRD

But why leave a knowledge of birds to poets and naturalists? Go yourself to the field and learn that birds do not exist solely in books, but are concrete, sentient beings, whose acquaintance may bring you more unalloyed happiness than the wealth of the Indies.

John Burroughs understands this when he writes of the study of birds: "There is a fascination about it quite overpowering. It fits so well with other things—with fishing, hunting, farming, walking, camping out—with all that takes one to the fields and woods. One may go a blackberrying and make some rare dis-

XUM

Photo by John Woodcock

A RUFFED GROUSE ABOUT TO DRUM (SEE PAGE 695)

Of all the characteristics of this superb game bird, its habit of drumming is perhaps the most remarkable. This loud tattoo begins with the measured thump of the big drum, then gradually changes and dies away in the rumble of the kettle-drum. It may be briefly represented thus: *Thump—thump—thump—thump, thump; thump, thump-rup rup rup rup r-r-r-r-r-r-r-r-r.* The sound is produced by the male bird beating the air with his wings as he stands firmly braced on some favorite low perch; and it is now quite well known to be the call of the male to the female—an announcement that he is at the old rendezvous.

covery; or while driving his cow to pasture, hear a new song or make a new observation. Secrets lurk on all sides. There is news in every bush. What no man ever saw before may the next moment be revealed to you. What a new interest the woods have! How you long to explore every nook and corner of them!"

The scientific results to be derived from the study of birds are fully realized by the naturalist. But there are other results equally important. I would have every one know of them: results that add to our pleasure in field and wood, and give fresh interest to walks that before were eventless; that quicken both ear and eye, making us hear and see where before we were deaf and blind. Then, to our surprise, we shall discover that the forests and pastures we have known all our lives are tenanted by countless feathered inhabitants, whose companionship will prove a source of endless enjoyment.

I would enter a special plea for the study of birds in the schools; for the more general introduction of ornithology in natural-history courses. Frogs and crayfish serve an excellent purpose, but we may not encounter either of them after leaving the laboratory; whereas birds not only offer excellent opportunities for study, but are always about us, and even a slight familiarity with them will be of value long after school days are over.

Photo by Dwight Franklin

A KINGFISHER LEAVING ITS NEST

The shores of wooded streams or ponds are the chosen haunts of the kingfisher. Silently he perches on some limb overhanging the water, ever on the alert for food or foe. Paddle toward him as quietly as you please, just as you reach his danger line he drops from his perch and with loud, rattling call flies on ahead. This may be repeated several times, until finally the limits of his wanderings are reached, when he makes a wide detour and returns to the starting point.

THE BIRD'S PLACE IN NATURE*

About thirteen thousand species of birds are known to science. The structure of many of these has been carefully studied, and all have been classified, at least provisionally. Taken as a whole, the class Aves, in which all birds are placed, is more clearly defined than any other group of the higher animals—that is, the most unlike birds are more closely allied than are the extremes among mammals, fishes, or reptiles, and all living birds possess the distinctive characters of their class.

When compared with other animals, birds are found to occupy second place in the scale of life. They stand between mammals and reptiles, and are more closely related to the latter than to the former; in fact, certain extinct birds so clearly connect living birds with reptiles that these two classes are sometimes placed in one group—the Sauropsida.

The characters that distinguish birds

*On the structure of birds read Coues's Key to North American Birds, part II (Estes & Lauriat); Headley, The Structure and Life of Birds; Newton's Dictionary of Birds. Articles: Anatomy of Birds and Fossil Birds; Martin and Moale's Handbook of Vertebrate Dissection, part II; How to Dissect a Bird.

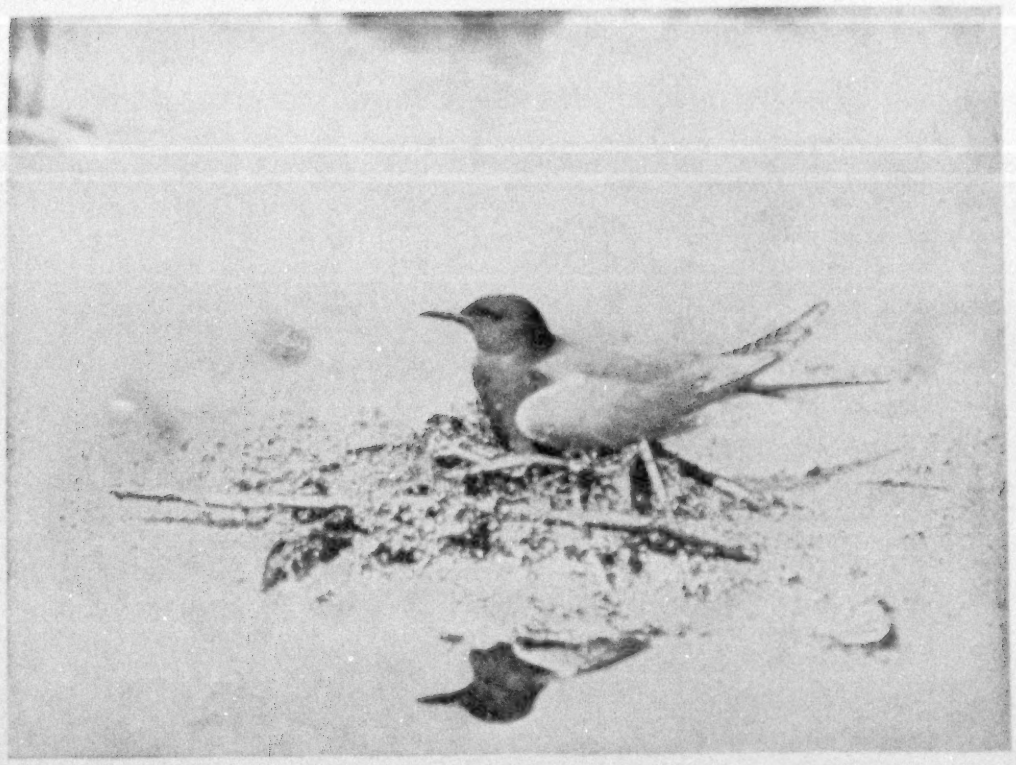


Photo by J. M. Schreck

A BLACK TERN ON ITS NEST (SEE PAGE 697)

Its nest, of reeds and grasses rather closely woven, is found in grassy marshes or in vegetation floating in a slough. It is an abundant species in the interior of the United States and subsists chiefly on dragon flies and various aquatic insects.

from mammals on the one hand and from reptiles on the other are more apparent than real. Thus flight, the most striking of a bird's gifts, is shared by bats among mammals. Egg-laying is the habit of most reptiles and of three mammals (the Australian duckbill and the echidnas). But incubation by one or both of the parents is peculiar to birds, though the python is said to coil on its eggs.

Birds breathe more rapidly than either mammals or reptiles, and their pneumaticity, or power of inflating numerous air-sacs and even certain bones, is unique.

The temperature of birds ranges from 100° to 112°, while in mammals it reaches 98° to 100°, and in the comparatively cold-blooded reptiles it averages only 40°.

The skull in mammals articulates with the last vertebra (atlas) by two condyles or balls; in birds and reptiles by only one. In mammals and birds the heart has four chambers; in reptiles it has but three.

BIRDS ARE DESCENDED FROM REPTILES

Mammals and reptiles both have teeth, a character possessed by no existing birds; but fossil birds apparently prove that early in the development of the class all birds had teeth.

Thus we might continue the comparison, finding that birds have no universal peculiarities of structure which are not present in some degree in either mammals or reptiles, until we come to their external covering. The reptile is scaled, and so is the fish; the mammal is haired, and so are some insects; but birds alone possess feathers. They are worn by every bird—a fit clothing for a body, which is a marvelous combination of beauty, lightness, and strength.

There is good evidence for the belief that birds have descended from reptilian ancestors. This evidence consists of the remains of fossil birds, some of which show marked reptilian characters and, as just said, are toothed. It is unnecessary to discuss here the relationship of the bird-like reptiles, but, as the most convincing argument in support of the theory of the reptilian descent of birds, I mention a restoration of the Archæopteryx, the earliest known progenitor of the class Aves. This restoration is based on an examination of previous restorations in connection with a study of the excellent plates which have been published of the

Photo by E. Van Altena

WOOD THRUSH AND NEST

His calm, restful song rings through the woods like a hymn of praise rising pure and clear from a thankful heart. It is a message of hope and good cheer in the morning, a benediction at the close of day.

XUM

Photo by Charles H. Tolman

SONG SPARROW (SEE PAGE 681)

The song sparrow's vast range in a dozen varying climates, its readiness to adapt itself to the different conditions in each of the regions it inhabits, its numerical abundance and steady increase while some of its family are dying out, its freedom from disease and vermin, and its perennial good spirits evidenced by its never-failing music—all proclaim that it is, indeed, one of Nature's successes. Its irrepressible vivacity and good spirits in spite of all circumstances are aptly illustrated by the fact that its song may be heard in every month of the year and in all weathers; also by night as well as by day, for nothing is more common in the darkest nights than to hear its sweet chant in half-conscious answer to the hooting of the owl or even the report of a gun.—ERNEST THOMPSON.

fossils themselves.* Two specimens have been discovered, one being now in the British Museum, the other in the Berlin Museum. They were both found in the lithographic slates of Solenhofen, in Bavaria, a formation of the Jurassic period, and, together, furnish the more important details of the structure of this reptile-like bird.

This restoration, therefore, while doubtless inaccurate in minor points, is still near enough to the truth to give a correct idea of this extraordinary bird's appearance.

*For papers on the Archæopteryx, see Natural Science (Macmillan Co.), vols. v-viii.

A PREHISTORIC REPTILE BIRD

The Archæopteryx was about the size of a crow. Its long, feathered tail is supposed to have acted as an aeroplane, assisting in the support of the bird while it was in the air, but its power of flight was doubtless limited. It was arboreal and probably never descended to the earth, but climbed about the branches of trees, using its large, hooked fingers in passing from limb to limb.

The wanderings of this almost quadrupedal creature must necessarily have been limited, but its winged descendants of today are more generally distributed than

XUM

Photo by E. Van Altena

STROKING A WOODCOCK ON ITS NEST

Low, wet woods, where skunk cabbage and hellebore thrive, or bush-grown, springy runs, are the woodcock's early haunts. In August, while molting, he often visits corn fields in the bottom lands, and in the fall wooded hillsides are his resorts. But, wherever he is, the woodcock leaves his mark in the form of "borings"—little holes which dot the earth in clusters and show where the bird has probed for earthworms with his long, sensitive bill, the upper mandible of which, as Mr. Gordon Trumbull has discovered, the bird can use as a finger.

Photo by A. L. Princehorn

ROBIN AND NEST (SEE PAGE 673)

Toward the last of June the young of the first brood, with the old mates, resort in numbers nightly to a roosting place. These roosts are generally in deciduous second growths, usually in low, but sometimes on high ground. The females are now occupied with the cares of a second family, and the males are said to return each day to assist them in their duties. Early in September, when the nesting season is over, robins gather in large flocks, and from this time until their departure for the South roam about the country in search of food, taking in turn wild cherries, dogwood and cedar berries. The songs and call-notes of the robin, while well known to every one, are in reality understood by no one, and offer excellent subjects for the student of bird language. Its notes express interrogation, suspicion, alarm, caution, and its signals to its companions to take wing; indeed, few of our birds have a more extended vocabulary.

are any other animals.* They roam the earth from pole to pole; they are equally at home on a wave-washed coral reef or in an arid desert, amid arctic snows or in the shades of a tropical forest. This is due not alone to their powers of flight, but to their adaptability to varying conditions of life. Although, as I have said, birds are more closely related among themselves than are the members of either of the other higher groups of animals, and all birds agree in possessing the more important distinguishing characters of their class, yet they show a wide range of variation in structure.

This, in most instances, is closely related to habits, which in birds are doubtless more varied than in any of the other higher animals. Some birds, like penguins, are so aquatic that they are practically helpless on land. Their wings are too small to support them in the air, but they fly under water with great rapidity, and might be termed feathered porpoises. Others, like the ostrich, are terrestrial, and can neither fly nor swim. Others still, like the frigate-birds, are aërial. Their small feet are of use only in perching, and their home is in the air.

If, now, we should compare specimens of penguins, ostriches, and frigate-birds

*On the distribution of animals read Allen, The Geographical Distribution of North American Mammals, Bulletin of the American Museum of Natural History (New York city), iv, 1892, pp. 199-244; four maps. Allen, The Geographical Origin and Distribution of North American Birds Considered in Relation to Faunal Areas of North America, The Auk (New York city), x, 1893, pp. 97-150; two maps. Merriam, The Geographic Distribution of Life in North America, with Special Reference to Mammalia, Proceedings of the Biological Society of Washington, vii, 1892, pp. 1-64; one map. Merriam, Laws of Temperature Control of the Geographic Distribution of Terrestrial Animals and Plants, NATIONAL GEOGRAPHIC MAGAZINE (Washington), vi, 1894, pp. 229-238; three maps.

Photo by A. L. Princehorn

A PAIR OF FLICKERS, OR YELLOW-HAMMERS, IN THEIR HOME (SEE PAGE 690)

The habits, notes, and colors of this well-known bird are reflected in the popular names which have been applied to it throughout its wide range. No less than 36 of these aliases have been recorded. The flicker is a bird of character. Although a woodpecker, he is too original to follow in the footsteps of others of his tribe. They do not frequent the ground, but that is no reason why he should not humor his own terrestrial propensities, and we may therefore frequently flush him from the earth, when, with a low chuckle, he goes bounding off through the air, his white rump showing conspicuously as he flies.

with each other, and with such widely different forms as humming-birds, woodpeckers, parrots, and others, we would realize still more clearly the remarkable amount of variation shown by birds. This great difference in form is accompanied by a corresponding variation in habit, making possible, as before remarked, the wide distribution of birds, which, together with their size and abundance, renders them of incalculable importance to man. Their economic value, however, may be more properly spoken of under—

THE RELATION OF BIRDS TO MAN

The relation of birds to man is threefold—the scientific, the economic, and the æsthetic. No animals form more profitable subjects for the scientist than birds. The embryologist, the morphologist and the systematist, the philosophic naturalist, and the psychologist all may find in them exhaustless material for study. It is not my purpose, however, to speak here of the science of ornithology. Let us learn something of the bird in its haunts before taking it to the laboratory. The living bird cannot fail to attract us; the dead bird—voiceless, motionless—we will leave for future dissection.

The economic value of birds to man lies in the service they render in preventing the undue increase of insects, in devouring small rodents, in destroying the seeds of harmful plants, and in acting as scavengers.

Leading entomologists estimate that insects cause an annual loss of at least two hundred million dollars to the agricultural interests of the United States. The statement seems incredible, but is based upon reliable statistics. This, of course, does not include the damage done to ornamental shrubbery, shade and forest trees. But, if insects are the natural enemies of vegetation, birds are the natural enemies of insects. Consider for a moment what the birds are doing for us any summer day, when insects are so abundant that the hum of their united voices becomes an almost inherent part of the atmosphere.

In the air swallows and swifts are

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Photo by Mrs. F. W. Roe

BLUE JAYS (SEE PAGE 687)

The blue jay, I fear, is a reprobate; but, notwithstanding his fondness for eggs and nestlings, and his evident joy in worrying other birds, there is a dashing, reckless air about him which makes us pardon his faults and like him in spite of ourselves. Like many men, he needs the inspiration of congenial company to bring out the social side of his disposition. When at home he is very different from the noisy fellow who, with equally noisy comrades, roams the woods in the fall.

coursing rapidly to and fro, ever in pursuit of the insects, which constitute their sole food. When they retire, the nighthawks and whippoorwills will take up the chase, catching moths and other nocturnal insects which would escape day-flying birds. The flycatchers lie in wait, darting from ambush at passing prey, and with a suggestive click of the bill returning to their post.

The warblers—light, active creatures—flutter about the terminal foliage, and, with almost the skill of a humming-bird, pick insects from leaf or blossom. The vireos patiently explore the under sides of leaves and odd nooks and corners to see that no skulker escapes. The woodpeckers, nuthatches, and creepers attend to the tree trunks and limbs, examining carefully each inch of bark for insects' eggs and larvæ, or excavating for the ants and borers they hear at work within.

On the ground the hunt is continued by the thrushes, sparrows, and other birds, who feed upon the innumerable forms of terrestrial insects. Few places in which insects exist are neglected; even some species which pass their earlier stages or entire lives in the water are preyed upon by aquatic birds.

A CONSTANT WARFARE AGAINST INSECTS

Birds digest their food so rapidly that it is difficult to estimate from the contents of a bird's stomach at a given time how much it eats during the day. The stomach of a yellow-billed cuckoo shot at 6 o'clock in the morning contained the partially digested remains of 43 tent caterpillars, but how many it would have eaten before night no one can say.

Mr. E. H. Forbush, ornithologist of the Board of Agriculture of Massachusetts, states that the stomachs of four chickadees contained 1,028 eggs of the cankerworm. The stomachs of four other birds of the same species contained about 600 eggs and 105 female moths of the cankerworm. The average number of eggs found in 20 of these moths was 185, and, as it is estimated that a chickadee may eat 30 female cankerworm moths per day during the 25 days which these moths crawl up trees, it follows that in this period each chickadee would destroy 138,750 eggs of this noxious insect.

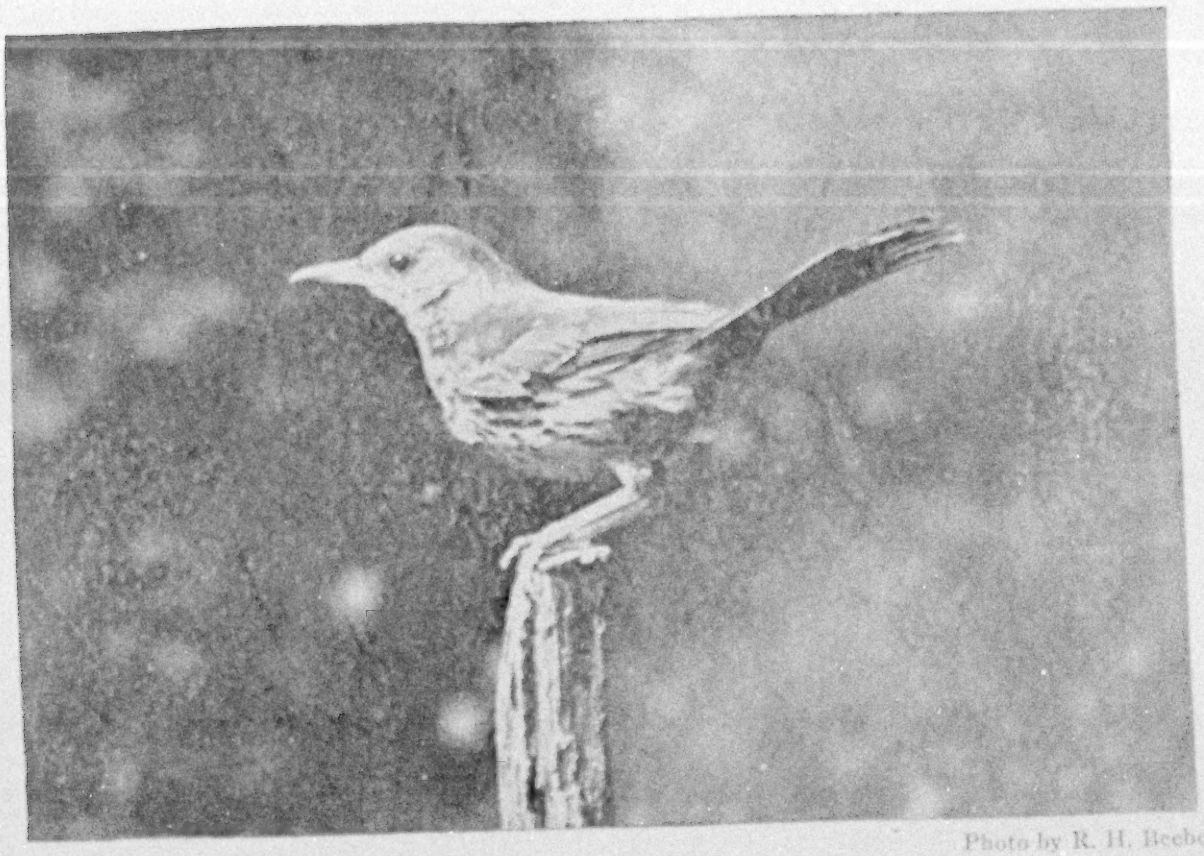

Photo by R. H. Beebe

BROWN THRASHER (SEE PAGE 677)

Hedge-rows, shrubbery about the borders of woods, scrubby growth, or thickets in dry fields, are alike frequented by the thrasher. Generally speaking, he is an inhabitant of the undergrowth, where he passes much time on the ground foraging among the fallen leaves. He is an active, suspicious bird, who does not like to be watched, and expresses his annoyance with an unpleasant kissing note or sharply whistled *wheèu*.

Professor Forbes, Director of the Illinois State Laboratory of Natural History, found 175 larvæ of *Bibio*—a fly which in the larval stage feeds on the roots of grass—in the stomach of a single robin, and the intestine contained probably as many more.

Many additional cases could be cited showing the intimate relation of birds to insect life and emphasizing the necessity of protecting and encouraging these little-appreciated allies of the agriculturist.

The service rendered man by birds in killing the small rodents so destructive to crops is performed by hawks and owls—birds the uninformed farmer considers his enemies. The truth is that, with two exceptions—the sharp-shinned and Cooper's hawk—all our commoner hawks and owls are beneficial. In his exhaustive study of the foods of these birds, Dr. A. K. Fisher, Assistant Ornithologist of the United States Department of Agriculture, has found that 90 per cent of the food of the red-shouldered hawk, commonly called "chicken-hawk" or "hen-hawk," consists of injurious mammals and insects, while 200 castings of the barn-owl contained the skulls of 454 small mammals, no less than 225 of these being skulls of the destructive field or meadow mouse.

HOW THE BIRDS HELP MANKIND

Still, these birds are not only not protected, but in some States a price is actually set upon their heads!

As destroyers of the seeds of harmful plants, the good done by birds cannot be overestimated. From late fall to early spring seeds form the only food of many birds, and every keeper of cage-birds can realize how many a bird may eat in a day. Thus, while the chickadees, nuthatches, woodpeckers, and some other winter birds are ridding the trees of myriads of insects' eggs and larvæ, the granivorous birds are reaping a crop of seeds which, if left to germinate, would cause a heavy loss to our agricultural interests.

As scavengers, we understand that certain birds are of value to us, and therefore we protect them. Thus the vultures

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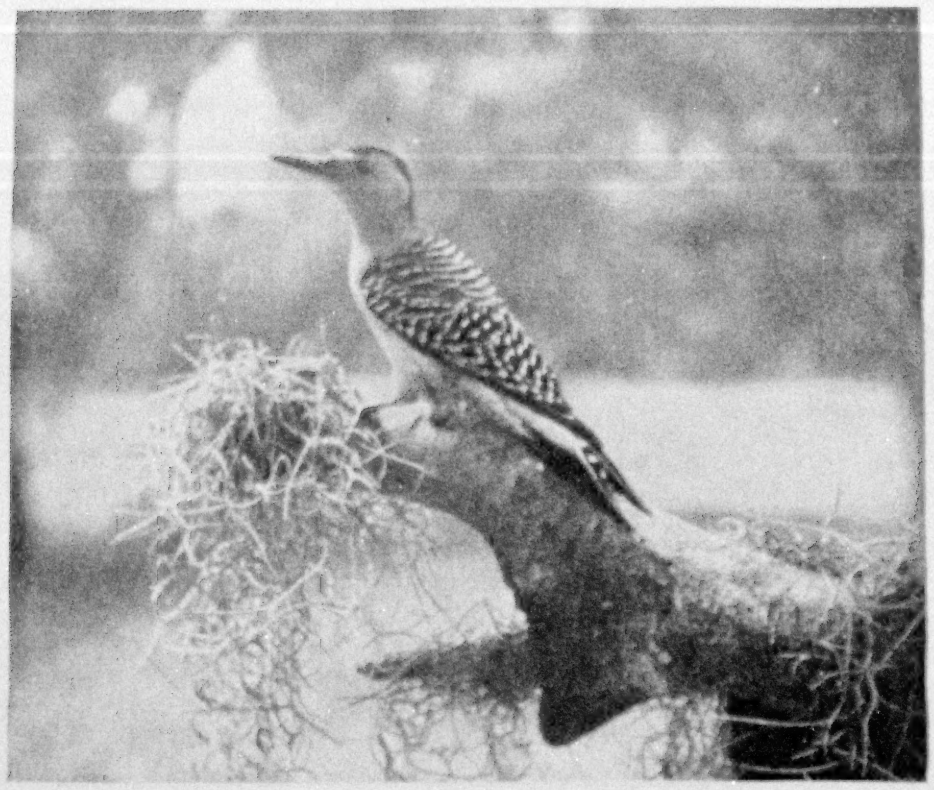

Photo by Mrs. F. W. Roe

A RED-BELLIED WOODPECKER

This is a common bird in our Southern States and occasionally is seen as far north as Massachusetts. It inhabits alike coniferous and deciduous growths, but prefers the latter. It ascends a tree in a curious, jerky fashion, accompanying each upward move by a hoarse *chŭh-chŭh*.

or buzzards of the South are protected both by law and public sentiment, and as a result they are not only exceedingly abundant, but remarkably tame. But we do not realize that gulls and some other water birds are also beneficial as scavengers in eating refuse, which if left floating on the water would often be cast ashore to decay. Dr. George F. Gaumer, of Yucatan, tells me that the killing of immense numbers of herons and other littoral birds in Yucatan has been followed by an increase in human mortality among the inhabitants of the coast, which he is assured is a direct result of the destruction of birds that formerly assisted in keeping the beaches and bayous free from decaying animal matter.

Lack of space forbids an adequate treatment of this subject, but reference to the works and papers mentioned below* will support the statement that, if we were deprived of the services of birds, the earth would soon become uninhabitable.

WHAT THEY ASK IN RETURN

Nevertheless, the feathered protectors of our farms and gardens, plains and forests, require so little encouragement from us—indeed, ask only tolerance—that we accept their services much as we do the air we breathe. We may be in debt to them past reckoning and still be unaware of their existence; but to appreciate the beauty of form and plumage of birds, their grace of motion and musical powers, we must know them.

The sight of a bird or the sound of its voice is at all times an event of such significance to me, a source of such unfailing pleasure, that when I go afield with those to whom birds are strangers I am deeply impressed by the compara-

*Notes on the Nature of the Food of the Birds of Nebraska, by S. Aughey; First Annual Report of the United States Entomological Commission for the Year 1877, Appendix ii, pp. 13-62. The Food of Birds, by S. A. Forbes; Bulletin No. 3, Illinois State Laboratory of Natural History, 1880, pp. 80-148. The Regulative Action of Birds upon Insect Oscillations, by S. A. Forbes; *ibid.*, Bulletin No. 6, 1883, pp. 3-32. Economic Relations of Wisconsin Birds, by F. H. King; Wisconsin Geological Survey, vol. i, 1882, pp. 441-610. Report on the Birds of Pennsylvania, with Special Reference to the Food Habits, based on over Four Thousand Stomach Examinations, by B. H. Warren; Harrisburg, E. K. Meyers,

Photo by Frank M. Chapman

AN OVEN-BIRD LOOKING OUT OF HER NEST

As an architect, the oven-bird is distinguished. Her unique nest is built on the ground of coarse grasses, weed stalks, leaves, and rootlets, and is roofed over, the entrance being at one side. It thus resembles an old-fashioned Dutch oven, and its shape is the origin of its builder's name.

tive barrenness of their world, for they live in ignorance of the great store of enjoyment which might be theirs for the asking.

I count each day memorable that brought me a new friend among the birds. It was an event to be recorded in detail. A creature which up to that moment existed for me only as a name, now became an inhabitant of my woods, a part of my life. With what a new interest I got down my books again, eagerly reading every item concerning this new friend—its travels, habits, and notes; comparing the observations of others with what were now my own!

The study of birds is not restricted to any special season. Some species are always with us. Long after the leaves have fallen and the fields are bare and brown, when insect voices are hushed, and even some mammals are sleeping their winter sleep, the cheery juncos flit about our doorstep, the white-throats twitter cozily from the evergreens, tree sparrows chatter gayly over their breakfast of seeds, and crows are calling from the woods. Birds are the only living creatures to be seen. What a sense of companionship their presence gives; how desolate the earth would seem without them!

The ease with which we may become familiar with these feathered neighbors of ours robs ignorance of all excuses. Once aware of their existence, we shall

State printer, large 8vo, pp. 434, plates 100. The English Sparrow in North America, especially in its Relation to Agriculture, prepared under the direction of C. Hart Merriam, by Walter B. Barrows; Bulletin No. 1, Division of Economic Ornithology and Mammalogy of the United States Department of Agriculture, 1889. The Hawks and Owls of the United States in their Relation to Agriculture, prepared under the direction of C. Hart Merriam, by A. K. Fisher; Bulletin No. 3, *ibid.*, 1893. The Common Crow of the United States, by Walter B. Barrows and E. A. Schwarz; Bulletin No. 6, *ibid.*, 1895. Preliminary Report on the Food of Woodpeckers, by F. E. L. Beal; Bulletin No. 7, *ibid.*, 1895. (See also many other papers on the food of birds in the Annual Report and Yearbook of the United States Department of Agriculture.) Birds as Protectors of Orchards, by E. H. Forbush; Bulletin No. 3, Massachusetts State Board of Agriculture, 1895, pp. 20-32. The Crow in Massachusetts, by E. H. Forbush; Bulletin No. 4, *ibid.*, 1896. How Birds Affect the Farm and Garden, by Florence A. Merriam; reprinted from "Forest and Stream," 1896, 16mo, pp. 31. Price, 5 cents. Useful Birds and their Protection, by E. H. Forbush; Massachusetts Board of Agriculture, 1907, and in the special publications of the United States Biological Survey.

XUM

Photo by E. G. Tabor

A LEAST BITTERN ON HER NEST

Wet, grassy marshes, such as rail love, or reed-grown ponds, are the resorts of these retiring secretive little birds. With outstretched necks and lowered heads they make their way without difficulty through the jungle of roots and stalks. Sometimes they climb up a slender reed and, hanging on like marsh wrens, survey their surroundings. They take wing almost from beneath one's feet, and, with a low, frightened *qua*, fly slowly for a short distance and then drop back into the grass. During the breeding season one may hear what presumably is the voice of only the male—a soft, slowly repeated, dove-like *coo, coo, coo, coo, coo*. It floats over the marsh like the voice of a spirit bird.

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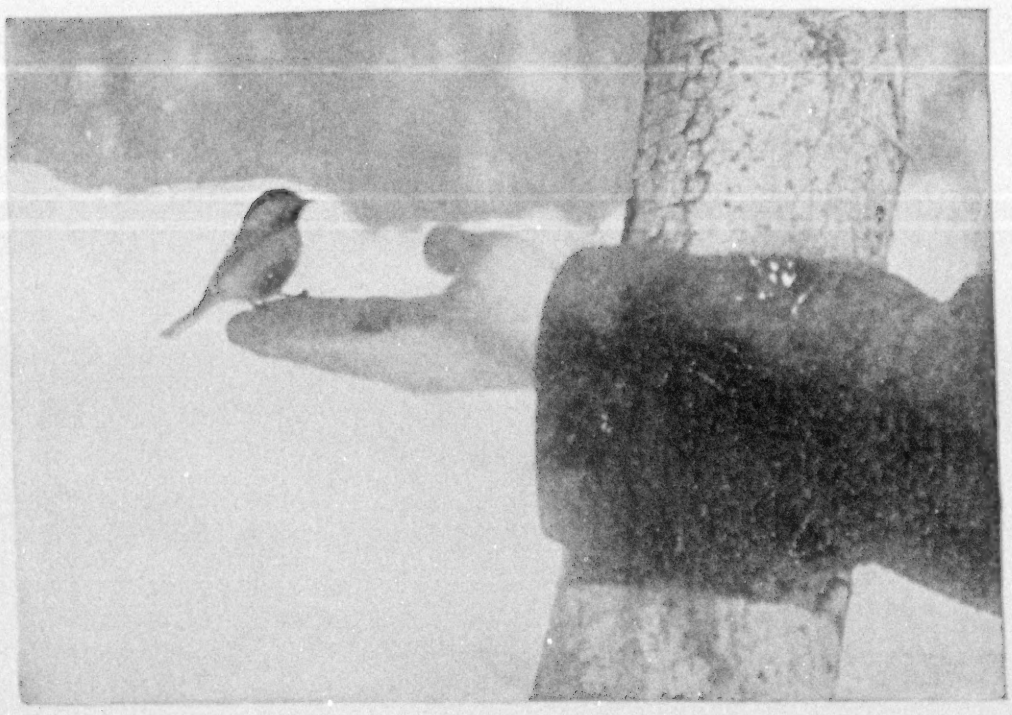

Photo by Frank M. Chapman

A BIRD IN THE HAND

see a bird in every bush and find the heavens their pathway. One moment we may admire their beauty of plumage, the next marvel at the ease and grace with which they dash by us or circle high overhead.

But birds will appeal to us most strongly through their songs. When your ears are attuned to the music of birds, your world will be transformed. Birds' songs are the most eloquent of Nature's voices: the gay carol of the grosbeak in the morning; the dreamy midday call of the pewee; the vesper hymn of the thrush; the clanging of geese in the springtime; the farewell of the bluebird in the fall—how clearly each one expresses the sentiment of the hour or season!

FEATHERED COMRADES

Having learned a bird's language, you experience an increased feeling of comradeship with it. You may even share its emotions as you learn the significance of its notes. No one can listen to the song of the mocking-bird without being in some way affected; but in how many hearts does the *tink* of the night-flying bobolink find a response? I never hear it without wishing the brave little traveler godspeed on his long journey.

As time passes you will find that the songs of birds bring a constantly increasing pleasure. This is the result of association. The places and people that make our world are every changing; the present slips from us with growing rapidity; but the birds are ever with us.

The robin singing so cheerily outside my window sings not for himself alone, but for hundreds of robins I have known at other times and places. His song recalls a March evening, warm with the promise of spring; May mornings, when all the world seemed to ring with the voices of birds; June days, when cherries were ripening; the winter sunlit forests of Florida and even the snow-capped summit of glorious Popocatepetl. And so it is with other birds. We may, it is true, have known them for years; but they have not changed, and their familiar notes and appearance encourage the pleasant self-delusion that we, too, are the same.

The slender saplings of earlier years now give wide-spreading shade; the scrubby pasture lot has become a dense woodland. Boyhood's friends are boys no longer, and there has even appeared another generation of boys whose presence is discouraging proof that for us youth has past. Then some May morning we hear the wood-thrush sing. Has he, too, changed? Not one note; and as his silvery voice rings through the woods, we are young again. No fountain of youth could be more potent. A hundred incidents of the long ago become as real

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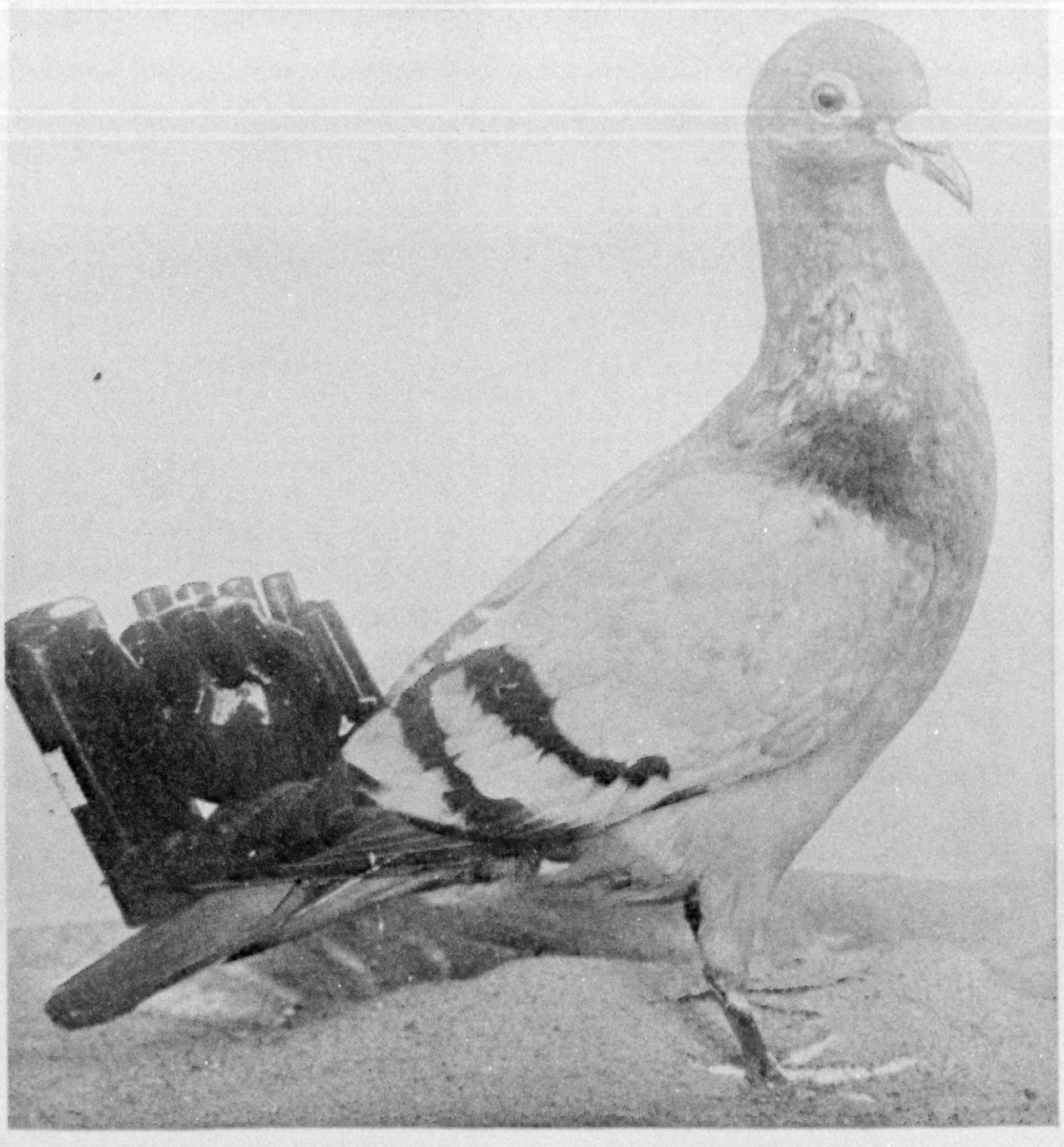

A PIGEON AND ITS WHISTLE: CHINA

These whistles, very light, weighing a few grams, are attached to the tails of young pigeons soon after their birth by means of fine copper wire, so that when the birds fly the wind blowing through the whistles sets them vibrating, and this produces an open-air concert, for the instruments in the same flock are all different (see page 715).

as those of yesterday. And here we have the secret of youth in age which every venerable naturalist I have ever met has convincingly illustrated. I could name nearly a dozen, living and dead, whom it has been my valued privilege to know. All had passed the allotted three-score and ten, and some were over four-score. The friends and associates of their earlier days had passed away, and one might imagine that they had no interest in life and were simply waiting for the end.

But these veterans were old in years only. Their hearts were young. The earth was fair; plants still bloomed and birds sang for them. There was no idle waiting here; the days were all too short. With what boyish ardor they told of some recent discovery; what inspiration there was in their enthusiasm!

So I say to you, if you would reap the purest pleasures of youth, manhood, and old age, go to the birds and through them be brought within the ennobling influences of Nature.

CHINESE PIGEON WHISTLES

WE ARE wont to speak of the Chinese as a sober, practical, and prosaic people, and to view them throughout in that light. Immensely rational they are, secular and worldly minded, bestowing their efforts on useful temporal affairs; but, nevertheless, they are by no means lacking in purely emotional matters of great attractiveness.

As early as the 11th century one of their greatest poets sang:

"Upon the bridge the livelong day
I stand and watch the goldfish play."

The domestication of the goldfish, the first species of which reached England only in 1691, and of the wonderful paradise-fish as well, is justly ascribed to the Chinese, and it is remarkable to notice that their attempts in this direction and the amazing results achieved were not prompted by any utilitarian views they had in mind, as neither fish is of any practical advantage. On the contrary, their skillful breeding, so eagerly pursued, is due solely and exclusively to the æsthetic tendency of the Chinese in their art of living and to their highly cultivated sense of beauty, which delights in the bright coloration of the skin of these fishes, the graceful form of their bodies, and the restless motions of their long, flowing fins.

While the almost Darwinian experiments to which Chinese breeders have subjected the goldfish, and their unbounded admiration of this little creature in its hundred and one forms and variations, illustrate well the intimate relation of the people to the element of water, their friendly associations with the world of birds are not less close and sympathetic. The lover of birds does not permanently confine his pet in its prison cage, but he takes it out with him on his walks, carrying it on a stick, to which one of its feet is fastened by means of a thread long enough to allow it ample freedom of motion. Where the shade of some stately tree bids him welcome, he makes a halt and permits the bird to perch and swing on a supple twig, watching it for hours.

One of the most curious expressions of emotional life is the application of whistles to a flock of pigeons. These whistles, very light, weighing a few grams, are attached to the tails of young pigeons soon after their birth, by means of fine copper wire, so that when the birds fly the wind blowing through the whistles sets them vibrating, and this produces an open-air concert, for the instruments in the same flock are all different. On a serene day in Peking, where these instruments are manufactured with great cleverness and ingenuity, it is possible to enjoy this aërial music while sitting in one's room.

There are two distinct types of whistles—those consisting of bamboo tubes placed side by side and a type based on the principal of tubes attached to a gourd. They are lacquered in yellow, brown, red, and black to protect the material from the destructive influences of the atmosphere. The tube whistles have either two, three, or five tubes. In some specimens the five tubes are made of ox-horn instead of bamboo. The gourd whistles are furnished with a mouthpiece and small apertures to the number of two, three, six, ten, and even thirteen. Certain among them have besides a number of bamboo tubes, some of the principal mouthpiece, some arranged around it. These varieties are distinguished by different names. Thus a whistle with one mouthpiece and ten tubes is called "the eleven-eyed one."

The explanation which the Chinese offer of this quaint custom is not very satisfactory. According to them, these whistles are intended to keep the flock together and to protect the pigeons from attacks of birds of prey. There seems, however, little reason to believe that a hungry hawk could be induced by this innocent music to refrain from satisfying his appetite; and this doubtless savors of an after-thought which came up long after the introduction of this usage, through the attempt to give a rational and practical interpretation to something that had no rational origin whatever; for it is not the pigeon that profits from this practice, but merely the human ear, which feasts on the wind-blown tunes and derives æsthetic pleasure from this music.

XUM

Photo from Catholic Foreign Mission Society of America

HUNTING WITH EAGLES IN CHINA

Falconry, that sport now long extinct, was one of the joys of our mediæval ancestors. Like printing and the mariner's compass, which are comparatively modern in the West, falconry has been known in China from time immemorial. In Europe the female of the peregrine falcon—one of the smallest of eagles—was alone used in this sport; but in China much larger birds are trained for the chase, birds far too large to sit on the hand, as the peregrines used to do when our forefathers followed the sport.

THE NATION'S CAPITAL

By James Bryce

Author of "The American Commonwealth," "Impressions of South America," etc., and Ambassador from Great Britain, 1906–1913

An address to the Committee of One Hundred on the Development of Washington, D. C. Specially revised by Mr. Bryce for publication in the National Geographic Magazine.

I HAVE been asked to give you the impressions of a visitor who, having seen something of the capitals of other countries and having spent six happy and interesting years in Washington, and having grown always more and more interested in your own plans for the adornment of Washington, may possibly be able to look at the matter from a somewhat different angle from that at which most of you have seen it.

It is, I think, impossible for any one who speaks our common language, who is familiar with your institutions and history, who recognizes how much there is in common between us—your nation and mine—to live here without becoming for many purposes—morally and intellectually, and for practically all purposes except, of course, political purposes—a citizen of the United States. That does not prevent him, I need hardly say, from remaining a patriotic citizen of his own country. He is exempt from the duty from which, indeed, you are all exempt in the District of Columbia—of casting a vote—and from the other duty of getting on the platform to give his political views to his fellow-countrymen; but in every other respect his residence here gives him all the advantages which you have, in being able to follow the ins and outs of your politics and to appreciate the surprising changes which the whirligig of time brings about.

Taking so keen an interest as I do in the welfare of the United States, I have often felt it somewhat difficult to refrain from offering advice which was not asked for. I trust that I have always refrained, but in this particular case the observations—I will not call them advice—the observations on the city of Washington and what can be done for it have been asked for, and if you find they are only what you knew before, do not altogether blame me, but lay it to the misjudgment of the too kind friends who have asked me to come upon the platform.

AN IDEAL SITE FOR A CITY

It is impossible to live in Washington and not be struck by some peculiar features and some peculiar beauties which your city possesses. In the first place, its site has a great deal that is admirable and charming. There is rising ground inclosing on all sides a level space, and so making a beautiful amphitheater, between hills that are rich with woods, which in many places, thanks to the hard ancient rocks of this region, show bold faces and give much more striking effects than we can have in the soft, chalky or sandy hills which surround London. Underneath these hills and running like a silver thread through the middle of the valley is your admirable river.

The Potomac has two kinds of beauty—the beauty of the upper stream, murmuring over a rocky bed between bold heights crowned with wood, and the beauty of the wide expanse, spread out like a lake below the city into a vast sheet of silver.

Besides all this, you have behind Washington a charming country. I am sometimes surprised that so few of your residents explore that country on foot. It is only on foot that you can appreciate its beauties, for some of the most attractive paths are too narrow and tangled for riding. On the north, east, and west sides of Washington, and to some extent on the south, or Virginia, side also, although there the difficulties of locomotion are greater on account of the heavy mud in the roads, the country is singularly charming, quite as beautiful as that which adjoins any of the great capital cities of Europe, except, of course, Constantinople, with its wonderful Bosphorus.

XUM

A VIEW OF THE NATION'S CAPITAL FROM ARLINGTON NATIONAL CEMETERY

"I know of no great city in Europe (except Constantinople) that has quite close, in its very environs, such beautiful scenery as has Washington in Rock Creek Park and in many of the woods that stretch along the Potomac on the north and also on the south side, with the broad river in the center and richly wooded slopes descending boldly to it on each side" (see page 719).

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No European city has so noble a cataract in its vicinity as the Great Falls of the Potomac—a magnificent piece of scenery which you will, of course, always preserve.

Vienna has some picturesque country, hills and woods and rocks within a distance of 25 or 30 miles. London also has very pleasing landscapes of a softer type within about that distance; but I know of no great city in Europe (except Constantinople) that has quite close, in its very environs, such beautiful scenery as has Washington in Rock Creek Park and in many of the woods that stretch along the Potomac on the north and also on the south side, with the broad river in the center and richly wooded slopes descending boldly to it on each side.

One may wander day after day in new walks all through these woods to the northwest and west of the city. One need never take the same walk twice, for there is an endless variety of foot-paths, each with its own vistas of woodland beauty.

THE WOODED CHARM OF THE WASHINGTON STREETS

Nor is Washington less charming in respect of its interior. I know of no city in which the trees seem to be so much a part of the city as Washington. Nothing can be more delightful than the views up and down the wider streets and avenues, especially those that look toward the setting sun or catch some glow of the evening light.

Look southwestward down New Hampshire avenue, look northwestward up Connecticut avenue, or even westward along modest little N street, which passes the house where I live, and whose vista is closed by the graceful spire of Georgetown University, and you have the most charming sylvan views, and all this is so by reason of the taste and forethought of those who have administered the government of the city and who have planted various species of trees, so that you have different kinds of sylvan views.

When you want a fine, bold effect, what could be grander than 16th street, with its incline rising steeply to the north, and the hills of Virginia as the background, where it falls gently away to the south? There are few finer streets in any city.

I do not mean to say that there are not many other capitals in this world to which Nature has been even more generous. You have not a beautiful arm of the sea at your doors, as has Constantinople, nor the magnificent mountains that surround the capitals of Rio Janeiro or Santiago de Chile, nor such a bay, or rather landlocked gulf, as that of San Francisco, with its splendid passage out to the ocean; but those are very rare things, of which there are few in the world. As capitals go, few, indeed, are so advantageously situated in respect to natural charms as is Washington.

All these considerations make one feel how great are the opportunities here offered to you for the further adornment and beautification of this city. Nature has done so much, and you have, yourselves, already done so much that you are called upon to do more. You have such a chance offered to you here for building up a superb capital that it would be almost an act of ingratitude to Providence and to history and to the men who planted the city here if you did not use the advantages that you here enjoy.

HOW WASHINGTON COMPARES WITH THE WORLD'S GREAT CAPITALS

Perhaps you might like to hear a few remarks on some of the other great capitals of the world. Take Berlin. It stands in a sandy waste, perfectly flat, with here and there a swampy pond or lake, and a sluggish stream meanders through it. Parts of the environs have, however, been well planted with trees, and this redeems the city to some extent. The streets are now stately, adorned by many a noble building. It has become, through the efforts of the government and its own citizens, an imposing city; but the environs can never be beautiful, because Nature has been very ungracious.

Take St. Petersburg. St. Petersburg has a splendid water front facing its grand river, the Neva, with its vast rush of cold green water, covered with ice in winter and chilling the air, and seeming to chill the landscape in summer. That, however, is the only beauty St. Petersburg has. The country is flat and in

A VIEW OF POTOMAC PARK AND OF THE POTOMAC RIVER: THE NATION'S CAPITAL.

"The Potomac has two kinds of beauty—the beauty of the upper stream, murmuring over a rocky bed between bold heights crowned with wood, and the beauty of the wide expanse, spread out like a lake below the city into a vast sheet of silver" (see page 717).

many places water-logged, owing to numerous pools and swamps. It has no natural attraction either in its immediate or more distant environs, except the stream of Neva.

Paris, again, has some agreeable landscapes within reach, but nothing at all striking, nothing nearly so fine in the lines of its scenery as the hills that inclose the valley in which Washington lies, and no such charm of a still wild forest as Washington affords. The Seine, too, is a stream not to be compared to your Potomac.

The same thing may be said of Madrid. It stands on a level, and the mountains are too distant to come effectively into the landscape, and its only water is a wretched little brooklet called the Manzanares. They tell a story there about a remark attributed to Alexandre Dumas when he visited Madrid. He was taken to the lofty bridge which spans the ravine at the bottom of which the rivulet flows. The day was hot and, being thirsty, he asked for a glass of water. They brought him the water, and he was about to drink, when looking down and catching sight of the streamlet, he said, "No, take it away; give it to that poor river; it needs a drink more than I do."

Then there is our English London, which stands in a rather tame country. It is true that there are some charming bits of quiet and pretty rural scenery in Surrey and Sussex, within a distance of from 20 to 30 miles, and there are pleasing beech woods covering the chalky hills of Bucks. Yet Nature has done nothing for London comparable to what she has done for Washington. The Thames, although it fills up pretty well at high tide, is nowise comparable for volume or beauty of surroundings to your own Potomac.

These cities I have named have, however, something that you have not and cannot have for many a year to come. They are—and this applies especially to London and Paris—ancient cities. They have still, in spite of the destroying march of modern improvements, a certain number of picturesque buildings, crooked old streets, stately churches, and spots hallowed by the names of famous men who were born there or died there or did their work there.

You are still in the early days of your history and are only beginning to accumulate historic memories which in four or five centuries will be rich and charged with meaning like those of European cities.

But in every other respect you have in Washington advantages which these European cities do not possess. If you want to make any large street improvement in London or Paris it is a most costly business. The land is very dear. You cannot easily disturb the old lines of streets and the drains and water pipes and telephone lines that lie under them. Every improvement that has to be made in a city like London has to be made at a cost so heavy that where it is added to the necessary expenses of maintaining modern appliances and carrying out sanitary regulations in an old city the cost is almost prohibitory.

But here you have still plenty of space, and though the city is extending very fast on almost all sides, still if you take forethought and consider your future, you can lay out the tracts over which Washington is beginning to spread in a way that will have results far more beautiful than are attainable in the growing parts of Londan and Paris, where land is so expensive.

London and Berlin and Paris are crowded and you are not yet crowded. You have still elbow room here to do what you want.

A CITY DEDICATED ENTIRELY TO POLITICS AND GOVERNMENT

You possess another great advantage in not being a large commercial or manufacturing city. If you had manufactures you would have tall chimneys and, as it seems impossible to enforce an anti-smoke law in a manufacturing city, you would have black smoke, which would spoil the appearance of your finer buildings, especially those constructed of limestone or sandstone, the soot clinging to them as it does now to Westminster Abbey and St. Paul's Cathedral in London. You would not have the same satisfaction in making things beautiful. A murky cloud would hang thick and

Photo by Albert G. Robinson

THE PALISADES OF THE POTOMAC

"Nature has done nothing for London comparable to what she has done for Washington. The Thames, although it fills up pretty well at high tide, is nowise comparable for volume or beauty of surroundings to your own Potomac" (see page 721)

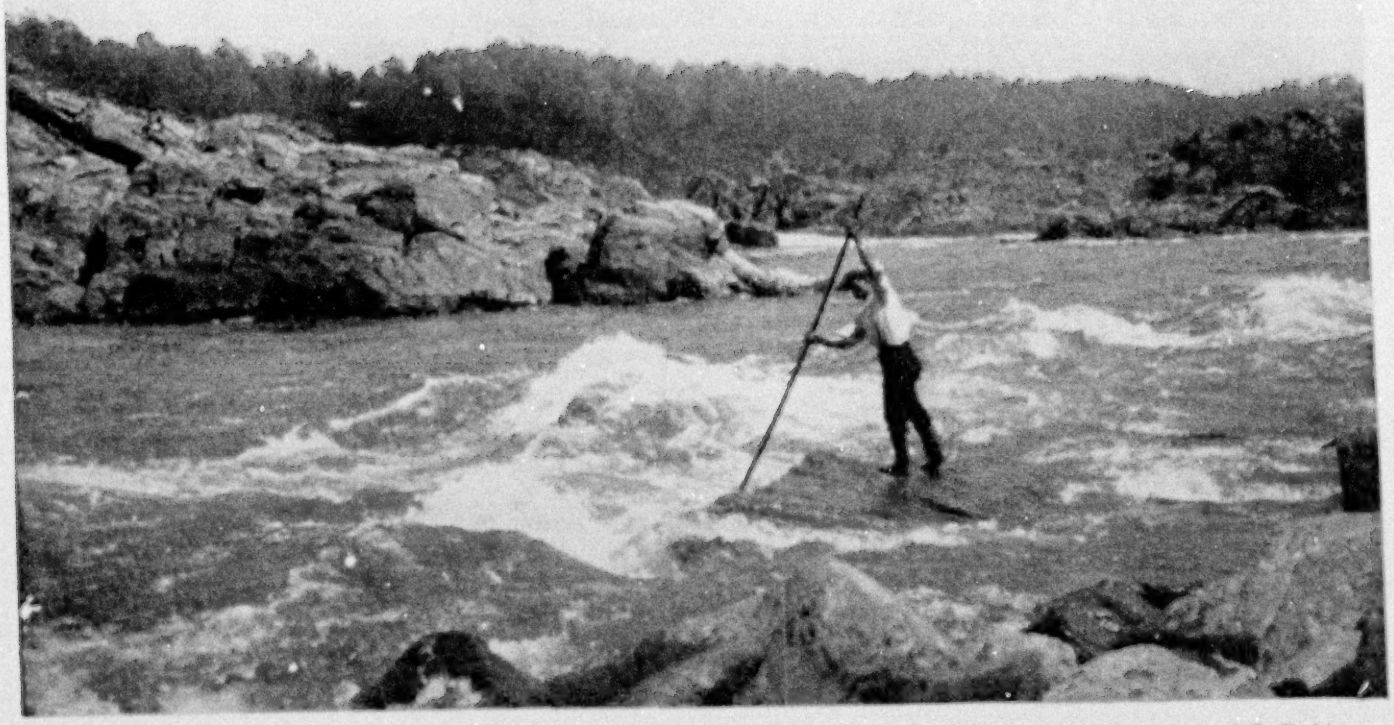


Photo by Alfred G. Robinson

IN THE RAPIDS OF THE POTOMAC

dark over your city as it does over Pittsburgh and Chicago. Moreover, your streets would be overcrowded and difficulties of rapid transit would arise.

With a much larger population, ideas of beauty would have to give way to those of commercial interests, whereas here the pressure of commerce is not such as to interfere with your ideals of beauty and convenience.

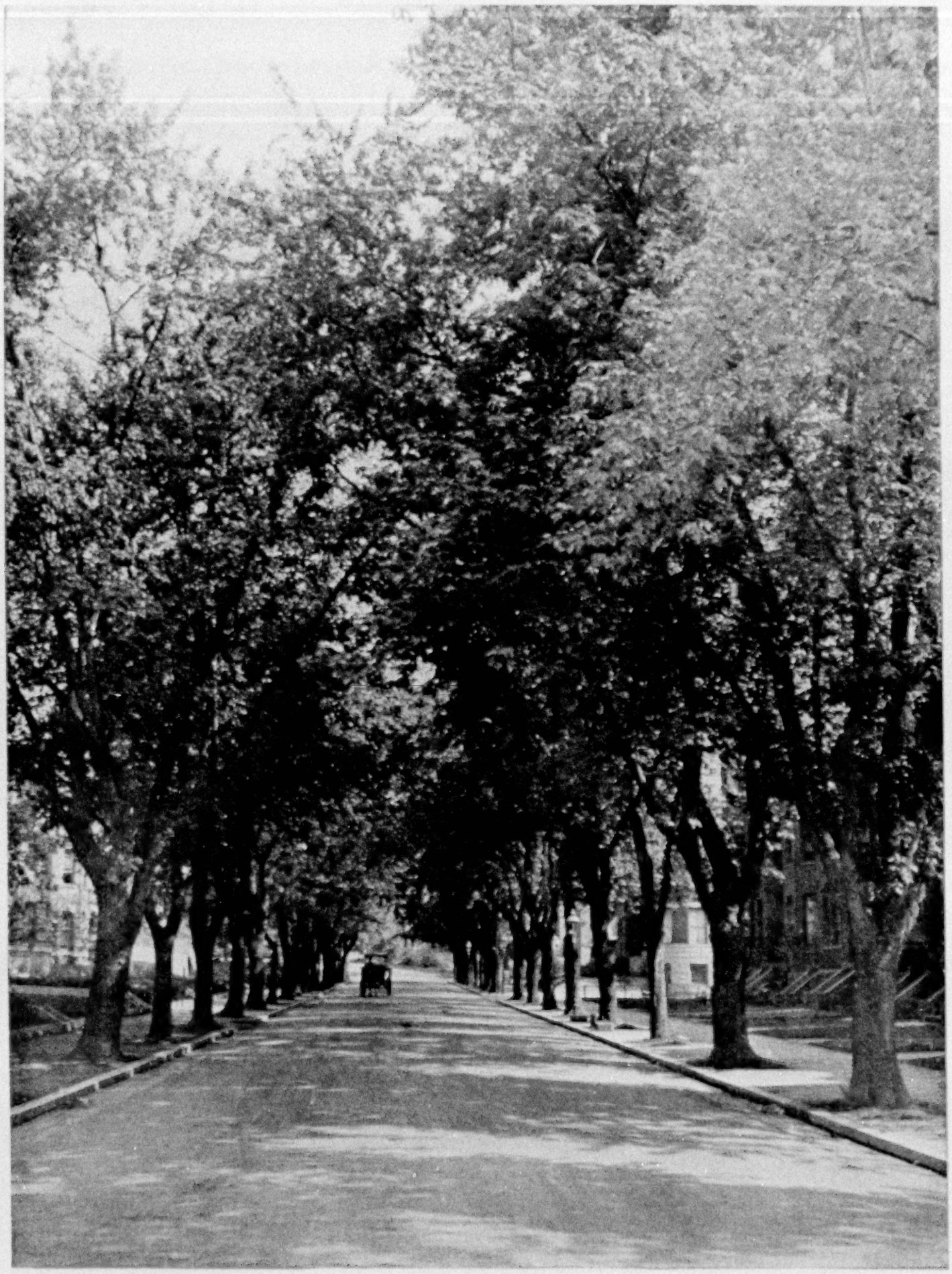
With all these advantages before you in Washington, and with the bottomless purse of Uncle Sam behind you—I am coming presently to the use that Uncle Sam's representatives may make of his purse for your benefit, but in the meantime we may assume it is an inexhaustible purse, because we know how much money he is able to spend upon objects that are certainly of no more importance than the beautification of Washington—with all those advantages ready to your hand, what may you not make of Washington? What may you not make of a city which is dedicated entirely to politics and government and society?

Mr. Henry James, in one of his interesting and subtle studies of modern American life, called Washington the City of Conversation. That is a happy characterization, having regard not only to Congress and politics, but also to all the interesting talk that goes on here about science in the Cosmos Club, and elsewhere about many things that are neither scientific nor concerned with any kind of work.

Washington is in a peculiar sense consecrated to society and to the higher charms of life; in fact, to all these things which make the delight of human intercourse; and therefore it is especially fitting that it should be able to live without the continual intrusion of those mighty factors of modern life—industrial production and commercial exchange—which dominate most of the cities of this continent and indeed most of the great cities of the modern world.

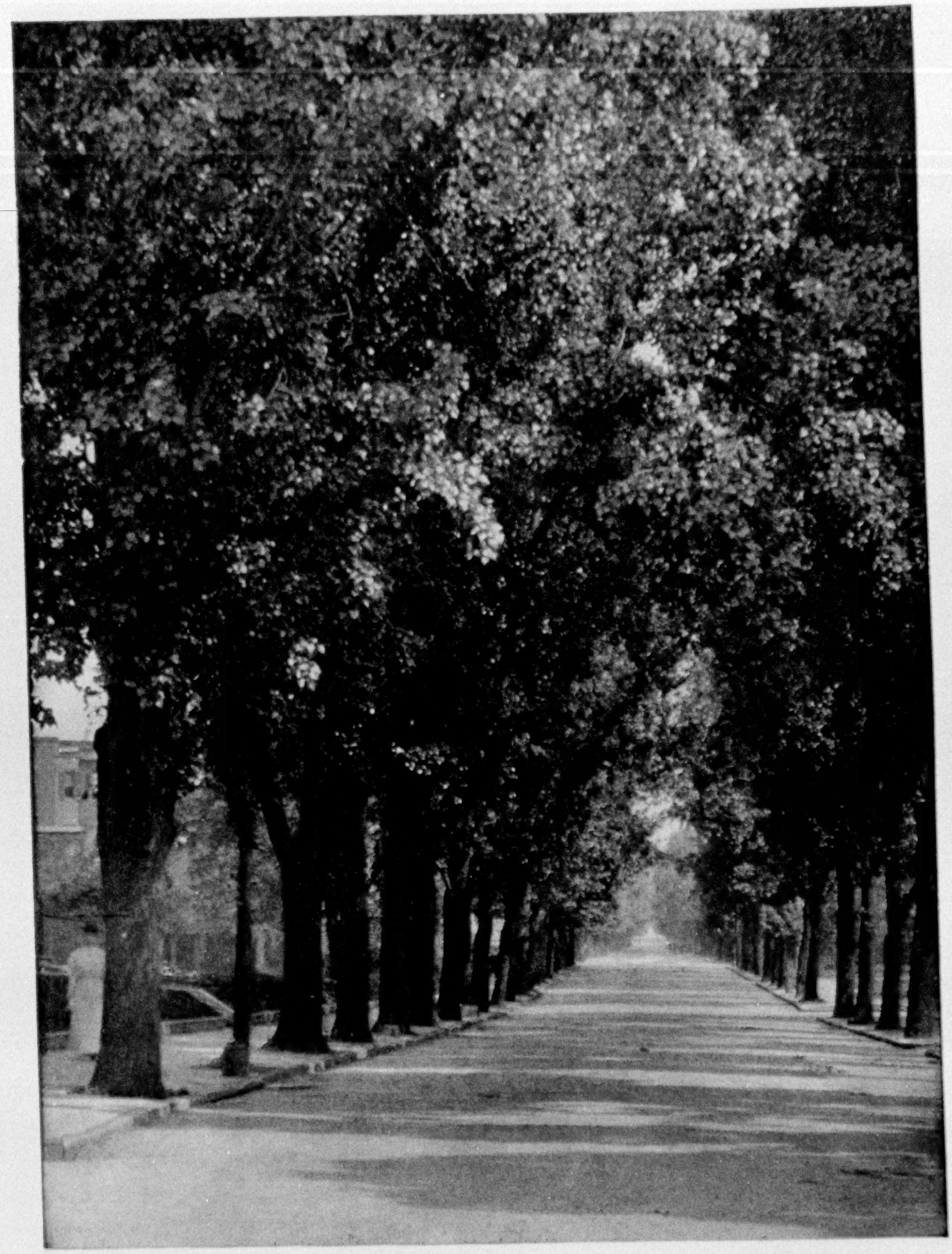
WASHINGTON SHOULD BE THE EMBODIMENT OF THE MAJESTY OF THE WHOLE NATION

From all that in Washington you are free, and it is fortunate you are free, because you are able to make a city of a



LOOKING UP NEW HAMPSHIRE AVENUE FROM DUPONT CIRCLE, SHOWING THE BEAUTIFUL ARCHING AMERICAN ELMS

"I know of no city in which the trees seem to be so much a part of the city as Washington. Nothing can be more delightful than the views up and down the wider streets and avenues" (see page 719).



ONE OF THE MOST BEAUTIFUL OF WASHINGTON STREETS IN EARLY SPRING: A VIEW LOOKING NORTH ON SEVENTEENTH STREET FROM MASSACHUSETTS AVENUE

"As capitals go, few are so advantageously situated in respect to natural charms as is Washington. All these considerations make one feel how great are the opportunities here offered to you for the further adornment and beautification of this city. Nature has done so much, and you have, yourselves, already done so much that you are called upon to do more" (see page 719).

XUM

THE LOVELY SILVER MAPLES OF K STREET, LOOKING EAST FROM SEVENTEENTH STREET

"You are able to make a city of a different kind; a city of a novel type; a city to which there will be nothing like in this country and hardly anything like in any other country" (see pages 723 and 728)

XUM

AN EARLY MORNING VIEW OF FIFTEENTH STREET, WHICH LATER IN THE DAY BECOMES ONE OF THE BUSIEST THOROUGHFARES IN THE CAPITAL CITY

"We are not to suppose that in thinking of the beauties of the city or country we are thinking of ourselves only, for beauty and ugliness have an effect upon the minds of all classes of residents" (see page 737)

different kind, a city of a novel type, a city to which there will be nothing like in this country and hardly anything like in any other country.

It was, we shall all agree, an act of wisdom on the part of the founders of the Republic when they determined to plant its capital in a place where there was not already a city and where there was no great likelihood that either commerce or industry conducted on a great scale would arise. It is true that one of the reasons assigned for choosing this spot was that here was the head of navigation on the Potomac, and that the spot would be a good commercial center for supplying the back country. Fortunately, that has not turned out to be so. The trade of Washington is not, and is not likely to be, a disturbing element.

It was wise to have the Capital City, the seat of the legislative, executive, and judicial branches of the government, removed from the influences of an immense population. You are a great deal better here for the purposes of conducting your politics in a calm and deliberate, a thoughtful and a philosophic spirit than if you were in New York, Philadelphia, or Chicago. Your city, it is true, is large and growing larger, but it is not likely to be the home of any vast, excitable, industrial population such as is growing up in these other cities. It is not receiving those crowds of immigrants which are making New York, Chicago, and, to a less extent, Cleveland, Cincinnati, Milwaukee, and St. Louis almost as much foreign as American.

In these circumstances, may not the city of Washington feel that its mission in life is to be the embodiment of the majesty and the stateliness of the whole nation; to be, as was well said by the previous speaker, a capital of capitals, a capital of the whole nation, overtopping the capitals of the several States as much as the nation overtops those States; representing all that is finest in American conception, all that is largest and most luminous in American thought, embodying the nation's ideal of what the capital of such a nation should be.

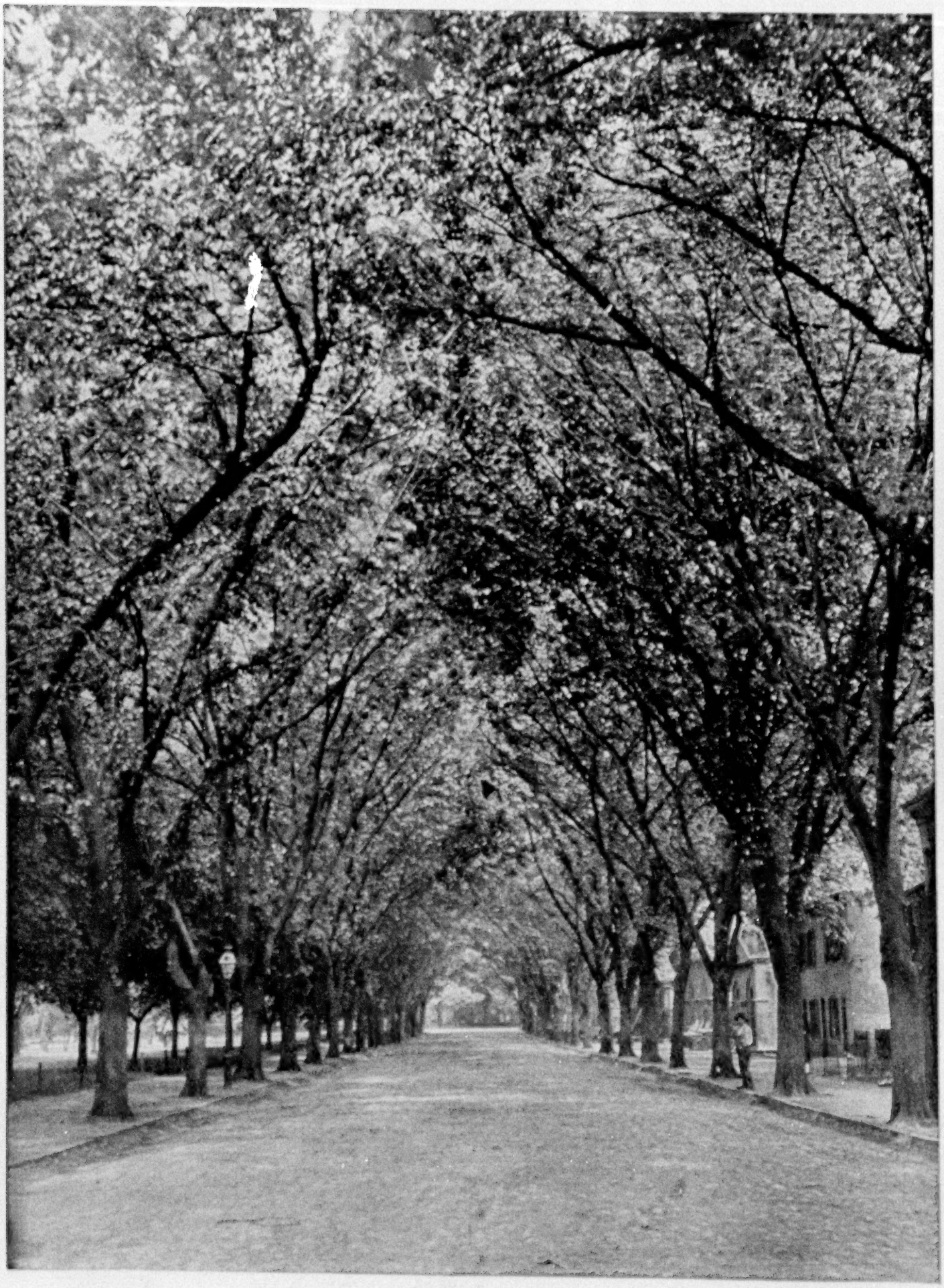
This it should accomplish partly by the stateliness and number and local disposition of its edifices; but above all by their beauty. What one desires is that this capital city should represent the highest aspirations as to external dignity and beauty that a great people can form for that which is the center and focus of their national life, and there is in the effort to do this here nothing to disparage the greatness of other American cities which have much larger populations and larger pecuniary resources.

WHAT A CAPITAL CAN DO FOR A NATION

Paris is the most striking instance in the modern world of a capital that has exercised a powerful influence on a great country. Some have thought its influence was too great, for it used to be the home not only of art, but also of revolution. Paris sometimes assumed for all France the right of saying what form of government France should have and who should hold the reins of power; but notwithstanding that, we must not ignore the great things Paris has done for France. In polishing the language, in forming a brilliant type of social life, and in being the center of the literary and artistic culture which has been radiated out over the whole country, Paris has done wonders.

But an even more striking instance of what a city can do is to be found in the ancient world; it is the instance of Athens. You all remember that wonderful speech in which the greatest of Athenian statesmen described what his city did for Greece, not only for the narrow territory of Attica, but for the whole of Greece. He showed how his city had made itself the finest embodiment of the Hellenic spirit. The highest creative talent in literature and art was concentrated in that one spot, where every intellectual influence played upon and refined every other; and as Athens represented the finest embodiment of ancient culture, so you would like Washington to represent your American ideals.

You would like it to give by its external splendor a sort of esthetic education to the people. You would like it to be a model of other cities, a model which the capitals of the greater States may all seek to vie with, as most of these States have



A GOTHIC ARCH OF AMERICAN ELMS

It is one of the regrettable features of the nation's capital that this noble avenue, Maine avenue, is in one of the most unfrequented and unpopular sections of the city

EAST CAPITOL STREET, LOOKING WEST FROM NEAR FIFTH STREET

Note the dome of the Capitol looming up in the distance between the magnificent American elms

already imitated, in the construction of their State capitols, the Capitol at Washington.

What you want is to have a city which every one who comes from Maine, Texas, Florida, Arkansas, or Oregon can admire as being something finer and more beautiful than he had ever dreamed of before; something which makes him even more proud to be an American; something which makes him wish to diffuse the same ideas of beauty through his own State as he sees set forth in visible form here.

You wish to have not only beautiful buildings, but you want to have everything else that makes the externals of life attractive and charming. You wish to have picture galleries. You wish to have museums. You have made advances in that direction already, for you have an admirable and constantly growing National Museum. You have the beginnings of a fine art gallery, and will doubtless add to it a national portrait gallery. You have admirable scientific institutions of many kinds, some of which will ultimately be housed in buildings finer than they have yet obtained. Some of the administrative departments of the government, especially the scientific departments, are organized on a scale such as can hardly be found elsewhere.

You have some splendid new buildings: for instance, the new railway station, with its two long and noble halls, that yields only to the magnificence of the new Pennsylvania station in New York.

You have also the Pan-American Building. That seems to me to be one of the most finished and graceful, one of the most happily conceived and skilfully executed buildings that has been erected anywhere within the last 30 or 40 years.

THE NEED OF A NATIONAL UNIVERSITY

Let me add that there is one thing that is still wanting. There ought to be a great National American University in Washington.

Through no fault either of the professors or of our friend who presides with so much wise care over the George Washington University here, that institution has not received those funds and those buildings which are needed to make it worthy of the name it bears. This is rather a digression, but I would like to say, as I have mentioned the university, that the suggestion that a great central university is needed does not by any means imply that such an institution should be managed by the nation through Congress, or should necessarily even receive from Congress the funds needed for its support.

You will all agree that a national capital ought to have a great university. It need not be of the same type as the great State universities, nor set itself to do all the things that are done in universities located in or near great cities. You have, for instance, no great industrial establishments here calling for a faculty of engineering or of other practical arts on such a scale as those universities must have, placed as they are, in great commercial centers.

What seems most directly needed is a university dedicated to three kinds of study—to theoretic science, to the arts and the "artistic side of life," and to what are called the human studies of a philological, historical, and political order. There is of course no reason why you should limit your aspirations; but the more immediate need in this city is not for an institution fitting men to enter upon any kind of technical work, in manufacturing or mining or agricultural industry, but for something of a different type.

You ought to have a fully equipped school of law, a complete and well staffed school of political science, and of economics, and therewith, also, a strong school of history. You have already in your government departments an unusually large number of eminent, industrious, and distinguished scientific men, who are one of the glories of Washington, and to match these you must also have a like galaxy of men pursuing those studies, such as history, economics, philology, and law, which are the complement of scientific studies.

Through the liberality of private benefactors, with perhaps some aid from the national government, it will surely be found possible before long to carry out

NEW YORK AVENUE, LOOKING EAST FROM ELEVENTH STREET

No city in the world can compare with Washington in the number and variety of its trees. The city literally possesses hundreds of miles of streets lined with double rows of thriving sycamore, oak, maples, elm, etc.

XUM

AN AVENUE OF HORSE CHESTNUTS: THIRTEENTH STREET, LOOKING NORTH FROM IOWA CIRCLE

THE AVENUE OF SUGAR MAPLES ON NINETEENTH STREET

the great idea which the first President had when he urged that a university should be established in this city, which was the darling thought and hope of his old age.

WHAT STILL NEEDS TO BE DONE

I have been invited by some of you to make a few suggestions as to some of the things that may be considered with a view to the beautification of Washington and the turning of its natural advantages to the best account.

It is hardly necessary to observe that there ought to be some method of securing a measure of symmetry and harmony in buildings. The public buildings to be erected should not be planted haphazard. Each building ought to be placed with some reference to the others, so that they will form, if possible, a group together, and all go to make up a good general effect.

In the same way, when laying out the streets, it is proper to consider the lines on which the streets may best be planned, so as to give the best scenic effect and so as to open up the best vistas. It is well to make some streets unusually wide, like 16th street, and to turn them in such a way that they shall give the best northwestern and western evening lights, and, if possible, a little piece of landscape effect at the end. Nothing is more charming than to see a bit of green landscape—trees or a grassy slope—at the end of a long street vista. There are some streets in the growing parts of Washington where that can be usefully done.

ODDITY BETTER THAN MONOTONY

I am far from suggesting that you should try to attain uniformity in your buildings, because uniformity usually ends in monotony. That can be seen in the buildings of Paris. When the city was largely rebuilt by Haussman in Louis Napoleon's day, that error was committed. While many of the boulevards of that time are very handsome, one gets tired of the repetition of the same designs and structure over and over again.

There is no doubt something almost grotesque in the manner in which private houses are placed side by side here in Washington—a large and handsome edifice, perhaps in the style of a French chateau, by the side of a mean little building of brick, or perhaps even of a wooden shack. A piece of castellated Romanesque in granite looks odd beside a colonial house in brick or stucco. Yet even this oddity is a better plan than the monotony of modern Paris or the far duller monotony of Harley street or Gower street in London.

When considering the beautifying of streets, something should be done to take into account the possibilities in the little open-space triangles that you have here in Washington at the intersection of streets and avenues. They are very pleasant places in the summer because they are green; but surely more might be made in a decorative way of them. You need not perhaps put up any more statues, but treat these corners in some ornamental fashion, so as to give them a greater landscape value than they have at present.

Questions relating to the river and the Potomac Park constitute a very large subject. You have, since the low ground along the Potomac has been reclaimed, a magnificent open space, and you have running through it and spread out below it on both sides of the island a magnificent expanse of water that is perhaps the strongest feature in Washington itself for scenic purposes (see page 720).

Much thought ought to be given to the treatment of Potomac Park, on this side the river, and possibly to the ground on the other side also, if you ever gain power to control the other side, so as to produce the best scenic effects.

I do not know whether any of you have been in Calcutta, but if so you will remember the only fine feature of that rather uninteresting city is the broad river and the very large, open grassy park which is called the Maidan, which borders on it. The river Hooghly and the Maidan redeem Calcutta. This park is a sort of huge Maidan for Washington. Ought not pains to be taken to plant groups of trees, some large groups and more small groups, so as to give fine combinations? One day these will grow to the size of old forest trees and the

A CANOPIED SIDEWALK IN WASHINGTON: LOOKING DOWN MASSACHUSETTS AVENUE FROM DUPONT CIRCLE

The sidewalk on each side of this noted avenue is lined with a double row of American lindens

effect will be impressive. We must take thought for even the distant future, for we are trustees in this way for posterity, and we want posterity to think well of us. Perhaps, too, a wild growth of small shrubs and herbaceous wild flowers might be encouraged over parts at least of the space, so as to make it as much as possible like a great natural park.

Some of the finest general prospects of Washington are to be had from those hills on the other side of the Anacostia River. Such sites ought to be treated so as to get the greatest effect from them, so that any one looking across from this side will have a pleasing view presented. Small, mean shacks or little groups of hovels ought to be kept off fine sites.

To care for these things ought not to be set down to personal fastidiousness. We are not to suppose that in thinking of the beauties of the city or country we are thinking of ourselves only, for beauty and ugliness have an effect upon the minds of all classes of residents. There are many places on the outskirts of this city which have become sordid and even hideous, owing to the habit of dumping refuse. It ought to be checked. I do not know what the powers of the District Commissioners are, but if they have not sufficient power to stop that defacement of nature they ought to be given such power. I suppose this refuse could be burned, and if so it certainly should be burned, or perhaps buried, so it would not offend those who walk around the city and see the beauties of our environs.

A reference to the Potomac leads me to speak of the splendid ridge of rocks forming the face of the hills on the Virginia side. They have been sadly cut into by quarries, spoiling the natural beauty of the rocks; but Nature will one day repair those blemishes. Perhaps she will not do so within the lifetime of most of us, but in the course of years, with rain and frost and vegetation, lichens, moss, and grass, Nature will soften the harshness of the rocks where the stone has been taken away, and you will again have picturesque cliffs along the banks of the Potomac, with the tall trees lifting their plumage into the sky behind. Those are very valuable elements in our Washington landscape.

It is desirable if possible to stop any further quarrying on the Potomac cliffs and to preserve the trees on the top of those cliffs on the Virginia side, and to make a good path, a walking path or riding path, or possibly a not too obtrusive driving road, along the top, looking down onto the river, from which you could get fine prospects. The road might be kept a little back, so as not to be conspicuous from below.

THE MOST BEAUTIFUL VIEW OF WASHINGTON IS THREATENED

May I mention a point of view that is now threatened and perhaps almost gone? You all know the spot at which Wisconsin avenue intersects Massachusetts avenue, which has now been extended beyond that intersection into the country. At that point of intersection, just opposite where the Episcopal Cathedral is to stand, there is one spot commanding what is one of the most beautiful general views of Washington. You look down upon the city, you see its most striking buildings—the Capitol, the Library, State, War, and Navy Department, and the Post-Office and other high buildings along Pennsylvania avenue—and beyond them you see the great silvery flood of the Potomac and the soft lines fading away in dim outline in the far southeast. It is a delightful and inspiring view.

It is a view that reminds one of some of those ample prospects over Rome which the traveler is able to obtain from St. Peter Montorio, on the further side of the Tiber, or from Monte Mario.

All that piece of land is being now cut up, and according to present appearances houses will be built there immediately, and after two years nobody will ever see that view again except from the tower of the cathedral when erected. Can it be saved?

There may be other views of Washington that are as good, but there is none better. It is a view that speaks not only to the eye, but to the imagination also. The top of the slope ought to have been

turned into a public park, and the houses below kept at such a height that if they were to be built they would not obstruct the view from above.

Of course it is to be regretted that all of that piece of land on both sides of Massachusetts avenue, and especially the part between Massachusetts and Connecticut avenues, was not kept for the Washington of the future. It is one of the saddest things we have seen, the way in which that beautiful bit of woodland country between Massachusetts avenue and Connecticut avenue, where some of us used to take our favorite recreation under the leafy boughs, listening to the songs of the birds in spring and to the murmuring of the little brooks that purled down the hollows, to know that this tract has now been leveled, the tiny glens filled up and the brooks turned into subterranean drains. It will soon be covered with villas or rows of dwellings, and 30 years hence no one will know how charming that side of Washington was.

THE BEAUTIES OF ROCK CREEK PARK

From these vain regrets let me turn to say something more about Rock Creek, where there is still time to save beauties that are threatened.

To Rock Creek there is nothing comparable in any capital city of Europe. What city in the world is there where a man living in a house like that in which we are meeting, in 18th street, can within less than 10 minutes by car and within a quarter of an hour on his own feet get in a beautiful rocky glen, such as you would find in the woods of Maine or Scotland—a winding, rocky glen, with a broad stream foaming over its stony bed and wild leafy woods looking down on each side, where you not only have a carriage road at the bottom, but an inexhaustible variety of foot-paths, where you can force your way through thickets and test your physical ability in climbing up and down steep slopes, and in places scaling the faces of bold cliffs.

All that you have in Rock Creek Park. And yet I am told that a good deal of the land behind Rock Creek Park is being sold for building purposes. The beauty of a portion of the park has already been spoiled at the place where the Mt. Pleasant road goes down into the park toward Pierce's Mill, by the erection of a row of not too beautiful houses. A great deal of the land which lies northwest of Rock Creek Park, toward Connecticut avenue, does not belong to the District.

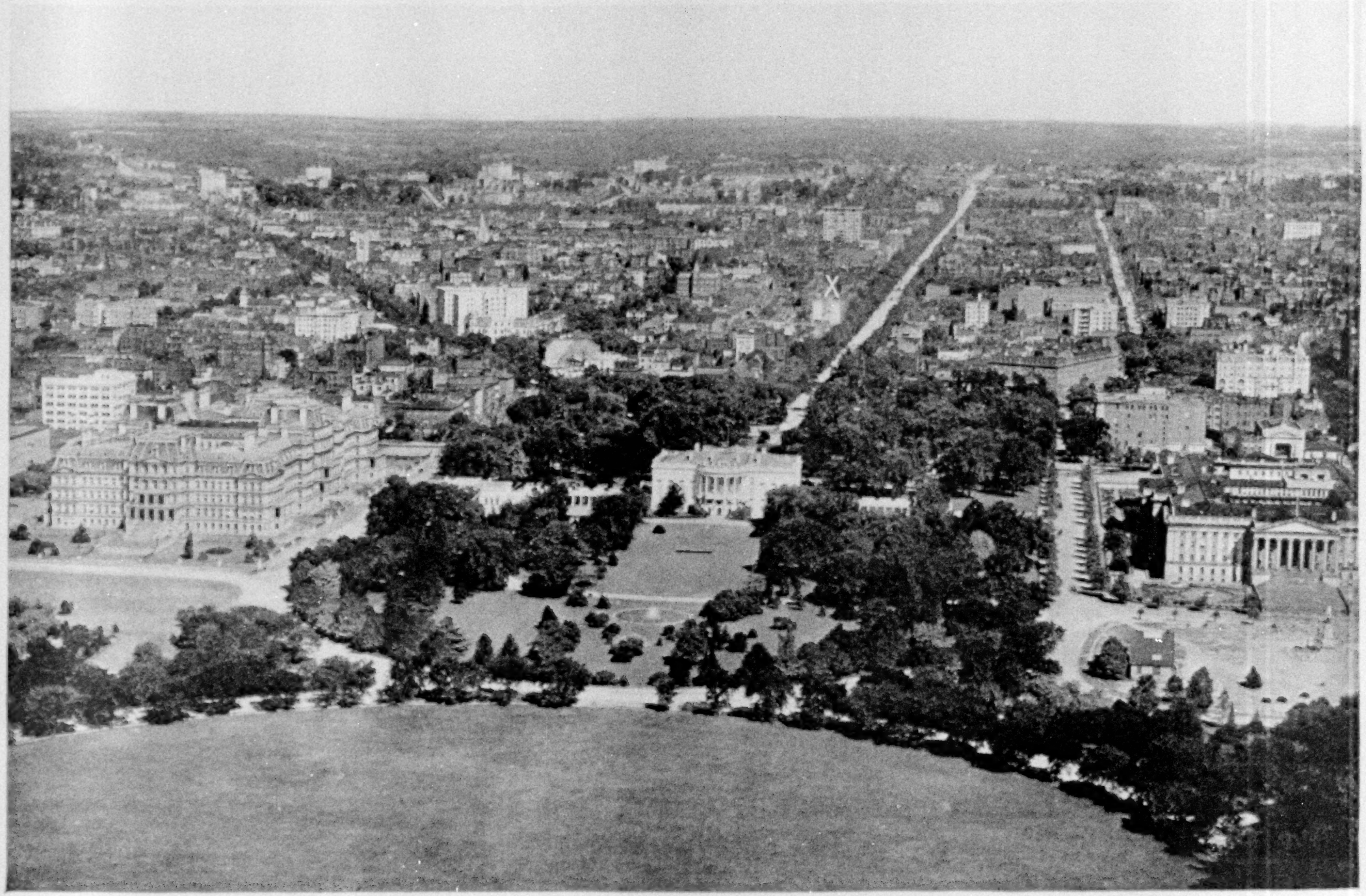
And yet it is quite essential to the beauty of Rock Creek Park that that tract of charming woodland should not be built upon. The builder has been stealing steadily forward to the edge of the park. Before long much of this tract will be covered with buildings. There is still time to stop that. There is still time to see that all that is not yet touched by buildings—at least that land between Connecticut avenue and Rock Creek, on the one side, and between Rock Creek and the continuation of Georgia avenue, toward Silver Spring, on the other—and, above all, to see to it that the valley of the creek itself, which is now thickly wooded, shall be kept forever as a part of the Rock Creek Park.

I should like to go even further—although perhaps I am indulging in aspirations and not sufficiently thinking of appropriations—and consecrate the whole of Rock Creek Valley for 10 or 12 miles above Washington to the public. It is a very beautiful valley. If you will take the Chevy Chase car until it crosses Rock Creek and then follow the creek up toward the west for a few miles, and then turn back to the car line aforesaid and follow the creek down the whole way till you strike the Military Road, below Fort Stevens, you will pass through a variety of river and woodland scenery which it is extraordinary to find so close to a great city.

Along one part of the stream there are places where the creek is deep and stagnant, with sandy pools; at other places the water runs swiftly, and there are ripples in the stream and many tiny cascades, where the water splashes over ridges of rock and twists round huge boulders. You will find an endless variety of beauty.

Some day or other such a piece of scenery will be of infinite value to the people of Washington, who want to re-

A CORNER IN MCPHERSON SQUARE



VIEW OF THE AVENUE OF THE PRESIDENTS, SHOWING POSITION OF HOME OF THE NATIONAL GEOGRAPHIC SOCIETY

The buildings of the National Geographic Society (directly under the cross near the center of the picture) face the wide avenue stretching north from the White House, formerly known as Sixteenth street, but renamed by the last Congress as The Avenue of the Presidents. The large building on the left is the State, War, and Navy Building, and the large building on the right is the United States Treasury.

XUM

LOOKING DOWN PENNSYLVANIA AVENUE FROM THE TREASURY BUILDING, SHOWING THE CROWDS WATCHING THE SUFFRAGETTE PARADE ON MARCH 3, 1913: THE CAPITOL MAY BE SEEN IN THE DISTANCE

Photo by Albert G. Robinson

A WALK IN ROCK CREEK PARK

"To Rock Creek Park there is nothing comparable in any capital city of Europe" (see page 738)

fresh their souls with the charms of Nature. All along the creek they will see a great many water-loving birds—kingfishers and ouzels and others too numerous to mention. All along the slopes and in the meadows by the stream they can find a great many beautiful wild flowers. I have found some quite uncommon and most lovely wild flowers growing there in the spring.

There are leafy glades where a man can go and lie down on a bed of leaves and listen for hours to the birds singing and forget there is such a place as Washington and such a thing as politics within eight miles of him.

These things you have now still left, though daily threatened, and what a pity it would be to lose them! At this moment the value of the outlying land I have referred to would not be very high. A good deal of it is not very suitable for buildings. A good deal of it is not used to any extent for agriculture.

A NATIONAL FOREST PARK NEAR THE CAPITAL

While on that subject I would like to refer to still another matter which has been mooted by those who are interested in public parks. It has found some favor in Baltimore and deserves to find favor in Washington. That is the creation of a large forest reserve between Washington and Baltimore, within, say, 25 miles of this city. There are lovely pieces of woodland on the Maryland side of the Potomac, behind Cabin John Bridge and above Cabin John, running along toward the neighborhood of Rockville. There is not much heavy timber; so the woods, though very pretty, cannot be of much pecuniary value.

The land is not very valuable for agri-

Photo by Albert G. Robinson

THE ENDLESS VARIETY OF BEAUTY OF ROCK CREEK PARK

"Along one part of the stream there are places where the creek is deep and stagnant, with sandy pools; at other places the water runs swiftly, and there are ripples in the stream and many tiny cascades, where the water splashes over ridges of rock and twists round huge boulders" (see page 738).

cultural purposes or it would have been turned into cultivation. So far as appears, nothing has been done or is being done with the land to make much profit out of it. There are many other pieces of woodland of great beauty farther to the northeast and east. Most if not all of those woods could be bought at moderate prices. They could be managed so as to bring in a revenue which would with good forestry methods perhaps return a profit, or at any rate pay the cost of administration.

What a thing it would be for the people of Baltimore and Washington to have an immense open space like that, where they could go out on Saturdays and Sundays, especially in the summer months; where they could wander about, have their picnic parties, and enjoy these pleasures of nature, which are the simplest and purest that God has bestowed upon his creatures the capacity of enjoying.

Now, you may say this is all very fine and pretty, but where are the funds to come from? Well, considering that the District of Columbia is Uncle Sam's property, and that his purse is a deep one, and that a wide-open region for recreation will become more and more valuable, and the obtaining it more and more costly as time goes on, what you have got to do is to educate public opinion and induce Congress to spend a moderate sum for this purpose, while the people of Baltimore induce their city and the State of Maryland to do the like. No people is really more idealistic than the Ameri-

XUM

Photo by Albert G. Robinson

IN THE SUBURBS OF WASHINGTON

can people, and if you once get hold of their imagination and appeal to their sense of the ideal, they will respond.

REMEMBER THE STORY OF THE SIBYL WHO CAME TO KING TARQUIN

You probably remember the old tale—I will not call it a threadbare story, but a time-honored story—of the sibyl who came to King Tarquin with nine books of prophecies to sell, and how when she named their price the king said it was too much. She went away and burned three of the books and came back, and still the king said the price was too much, and she went away and burned three more and came back with only three books and asked him to buy those, and then the king perceived there was more in the matter than he had supposed and gave her the price for the three that she had originally asked for the nine and regretted that the other six had been destroyed. Those three contained predictions and warnings which made the greatness of Rome. Who can tell how much longer the Roman Empire would have lasted if Tarquin had bought the whole nine.

So some day the people are going to set the true value upon all these things—these spots of beauty around Washington and all the tract behind the Rock Creek Valley and these woodlands I have spoken of. When that day comes one of two things will happen: Those who come after you will either have to pay far more for these pieces of ground than would have to be paid now, or else men will mourn in vain over opportunities of enjoyment forever lost. This is the favorable moment. The value of land near this great and growing city is rising every day. If you can but convince those who hold the purse-strings, it will be good business to buy now and dedicate to the public for all time to come.

YOU HAVE NEVER SUFFICIENTLY FORESEEN HOW ENORMOUSLY RICH AND POPULOUS A NATION YOU ARE GOING TO BE

The trouble has been with you that you have not been sufficiently hopeful in those past years during which wealth and population were growing all through the 19th century. It may seem strange to say so to an American audience, because

Photo by Albert G. Robinson

A FARMING SCENE IN THE OUTSKIRTS OF THE NATION'S CAPITAL.

you are supposed, and rightly, to be the most sanguine of peoples. Nevertheless, you have never sufficiently foreseen how enormously rich and populous a nation you are going to be.

I read lately a book in which a European traveler described the site of Washington as it was in 1795. He said it consisted of woods, through which he could not find his way from the village of Georgetown to the spot where now stands the Capitol. Just think what has been done since that time!

Look at the pace at which your city has been growing. Within the last six years it seems to me it has extended itself half a mile further into the country in every direction, covering what were then fields and woods with streets and squares.

As the result of the amazing growth of the United States you are going to have an enormous Capital, even if it has no large industries. We made the mistake in London of not foreseeing how London would grow. When we began 80 years ago to build railway stations we made little tiny stations, not realizing that the country and with it London were going to grow enormously, and that far more space would be needed for our increased traffic. It seems strange now that every man of sense did not foresee this growth and the need for preparing to meet it.

People ought to have realized 80 years ago what the progress of modern science was certain to achieve, what railroads were going to become, what larger facilities for transportation were sure to be required, how coal and steam power were going to increase wealth and industry, and how population would multiply. Whether any European countries will continue to grow as fast in the future as Britain and Germany have grown during the past 80 years, I will not venture to conjecture; but about the continuing increase of wealth and population here in the United States there can be no doubt at all.

GEORGE WASHINGTON'S FORESIGHT

That increase seems destined to continue here for at least a century and a half or two centuries to come, and at the end of that time no one can tell what

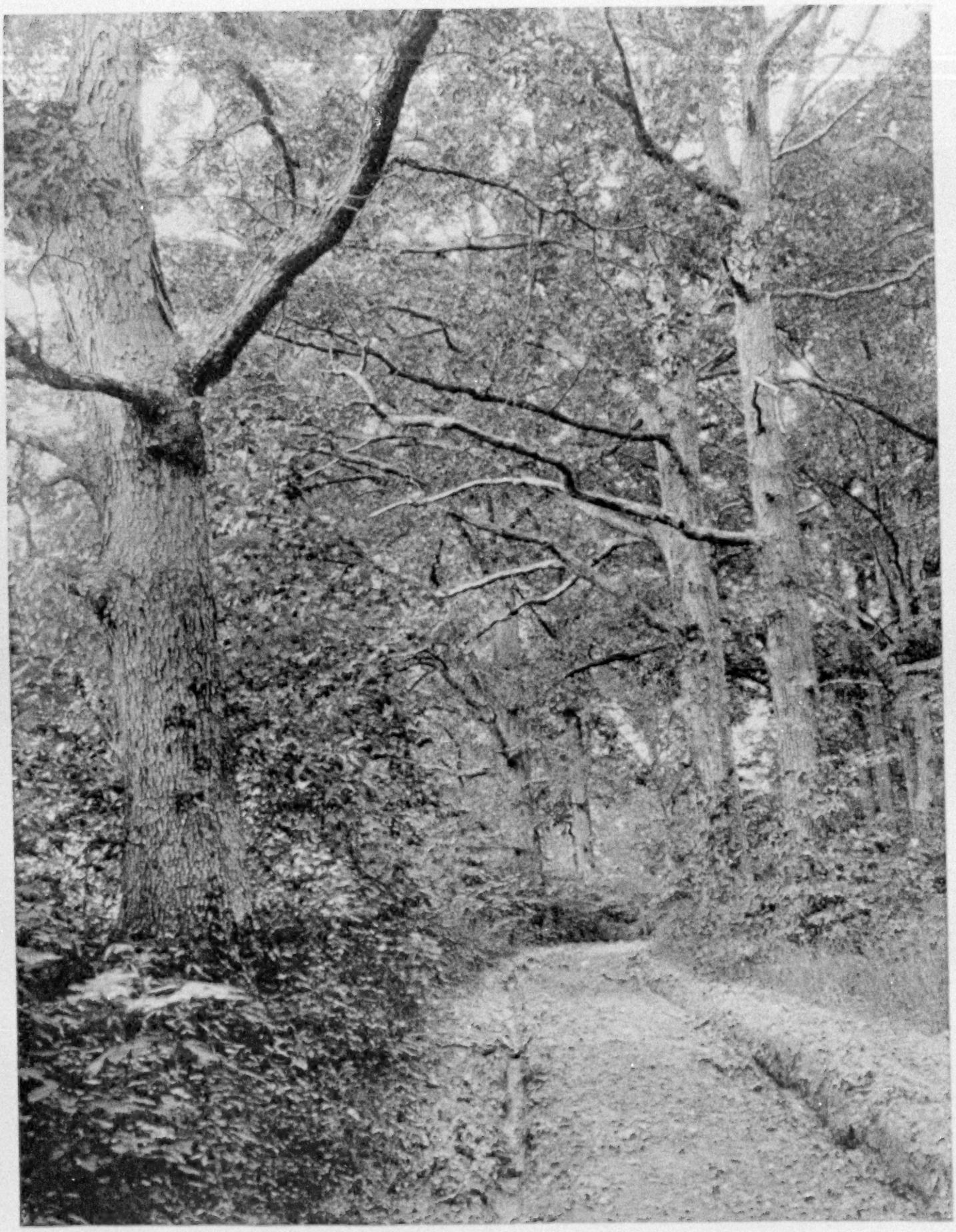


Photo by Albert G. Robinson

THE WOODS NEAR WASHINGTON

"One may wander day after day in new walks all through these woods to the northwest and west of the city. One need never take the same walk twice, for there is an endless variety of foot-paths, each with its own vistas of woodland beauty" (see page 719).

"What you want is to have a city which every one who comes from Maine, Texas, Florida, Arkansas, or Oregon can admire as being something finer and more beautiful than he had ever dreamed of before; something which makes him even more proud to be an American; something which makes him wish to diffuse the same ideas of beauty through his own State as he sees set forth in visible form here" (see page 731).

XUM

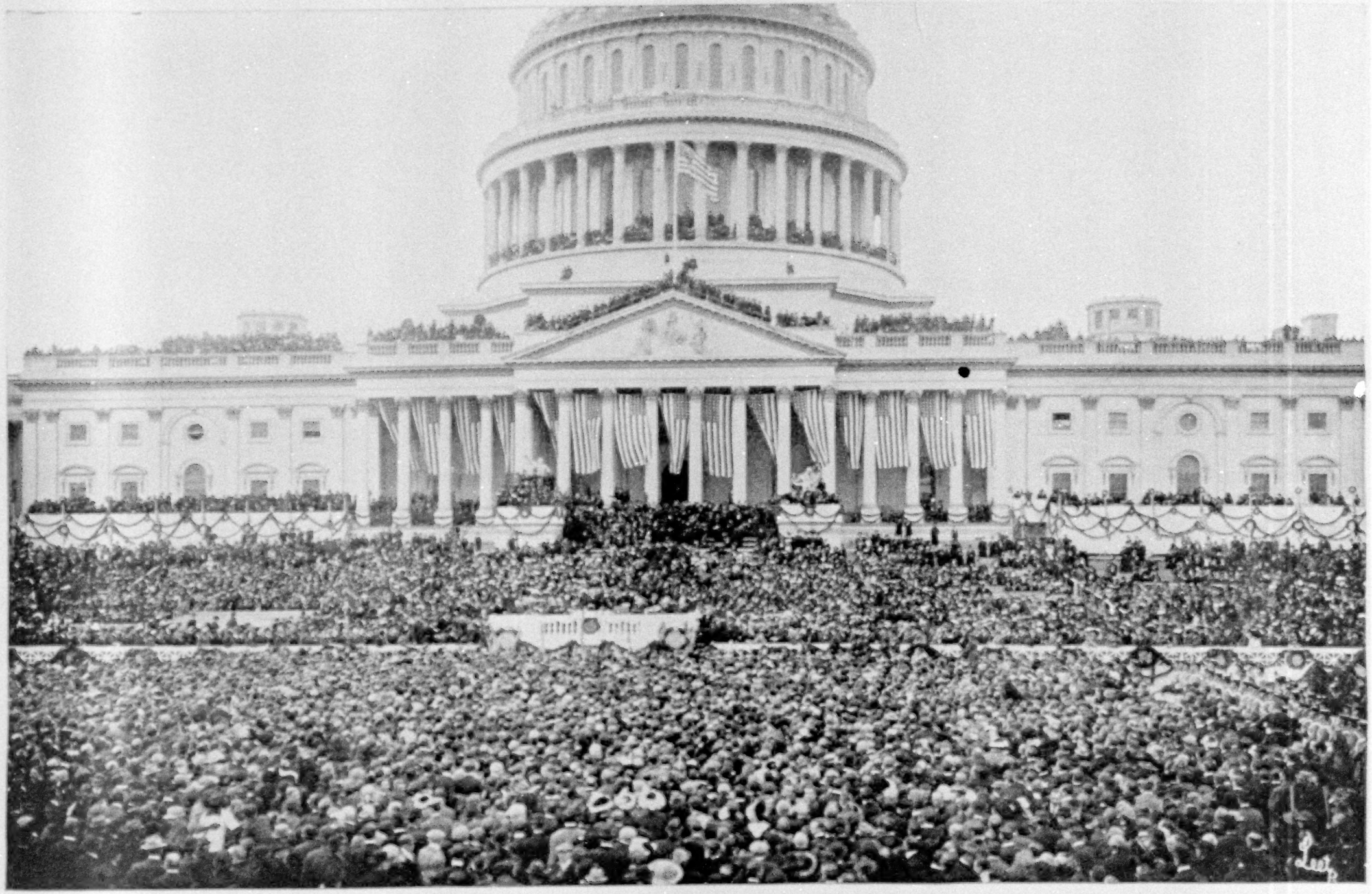


Photo by Leet Bros.

"The only man who seems to have foreseen the greatness of this city, so far as I can learn, was George Washington himself. Although he died before Louisiana was purchased and long before you acquired territory on the Pacific coast, he appears to have realized that this was going to be an enormous country and ought to have a grand capital" (see page 750).

XUM

Photo by Leet Bros.

"May not the city of Washington feel that its mission in life is to be the embodiment of the majesty and the stateliness of the whole nation, representing all that is finest in American conception, all that is largest and most luminous in American thought, embodying the nation's ideal of what the capital of such a nation should be" (see page 728).

your population may have become. That is the reason why you should think about these things now and make your preparations for the future. The only man who seems to have foreseen the greatness of this city, so far as I can learn, was George Washington himself.

Although he died before Louisiana was purchased and long before you acquired territory on the Pacific coast, he appears to have realized that this was going to be an enormous country and ought to have a grand capital, and you ought to go back to his ideals and render the greatest tribute you can render to his immortal memory.

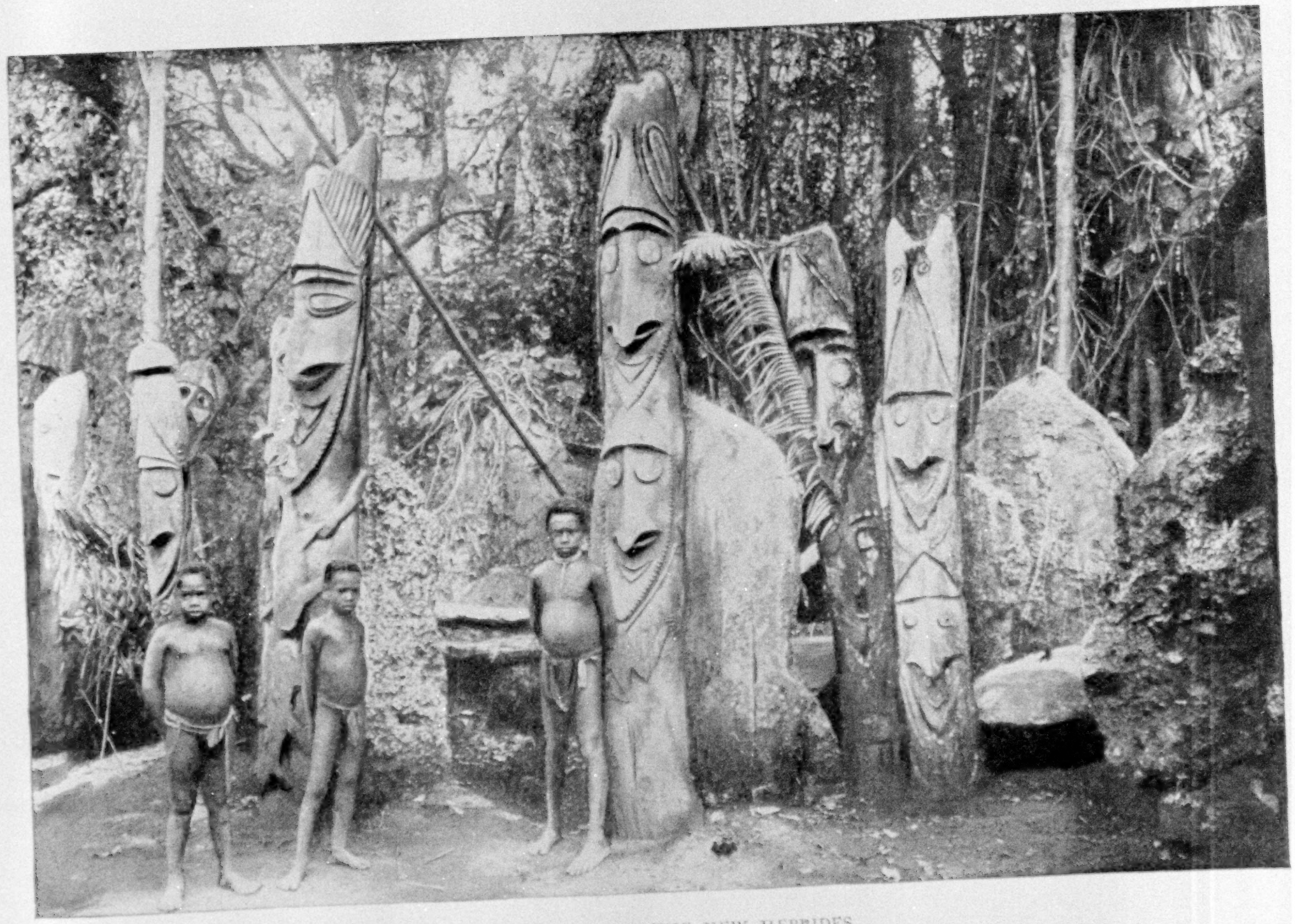
What you have got to do is to make the nation feel that it has a real living interest in Washington. Make the man from Maine and from Minnesota and from Florida feel that Washington belongs to him. It is not those only who live here in Washington that are the owners of Washington, but these men also who dwell all over the country. Many of them, and all their representatives, come here every year, and as they are proud of the nation they ought also to feel proud of their nation's capital.

Having lived in this city among you with so much happiness and enjoyment during the past six years, it is with deep regret that my wife and I are now preparing to depart from you. But, remembering the unceasing and unvarying kindness we have received from all of you here in Washington, we shall recall those six years with constant pleasure, continuing to cherish the recollection of our Washington friends, and our hopes and wishes will always be with those who are striving to make Washington beautiful, and a capital worthy of the majesty of this mighty nation.

Photo by Albert G. Robinson

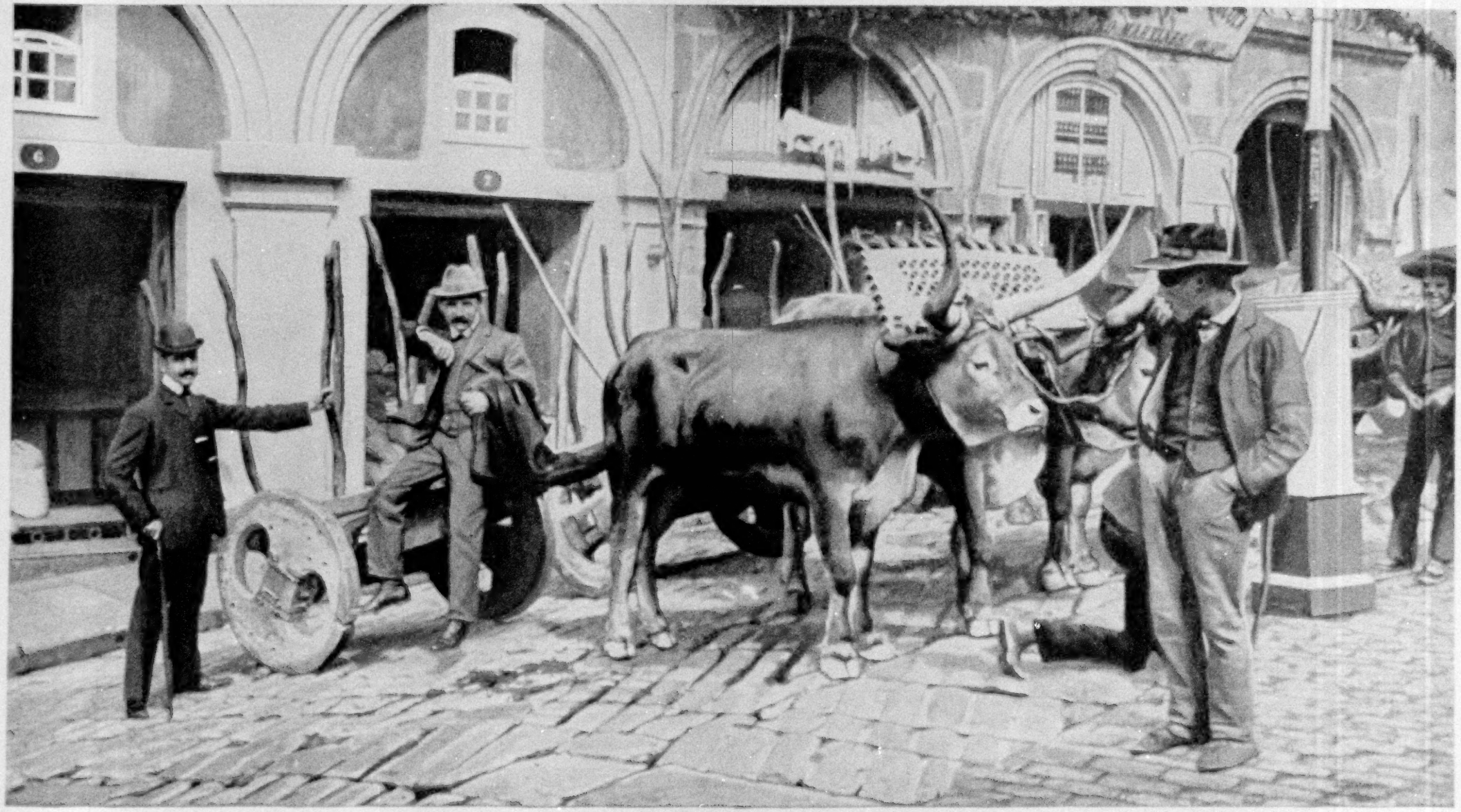
A SCENE IN ROCK CREEK PARK, IN THE NATION'S CAPITAL

XUM



TABOO SIGNS IN THE NEW HEBRIDES

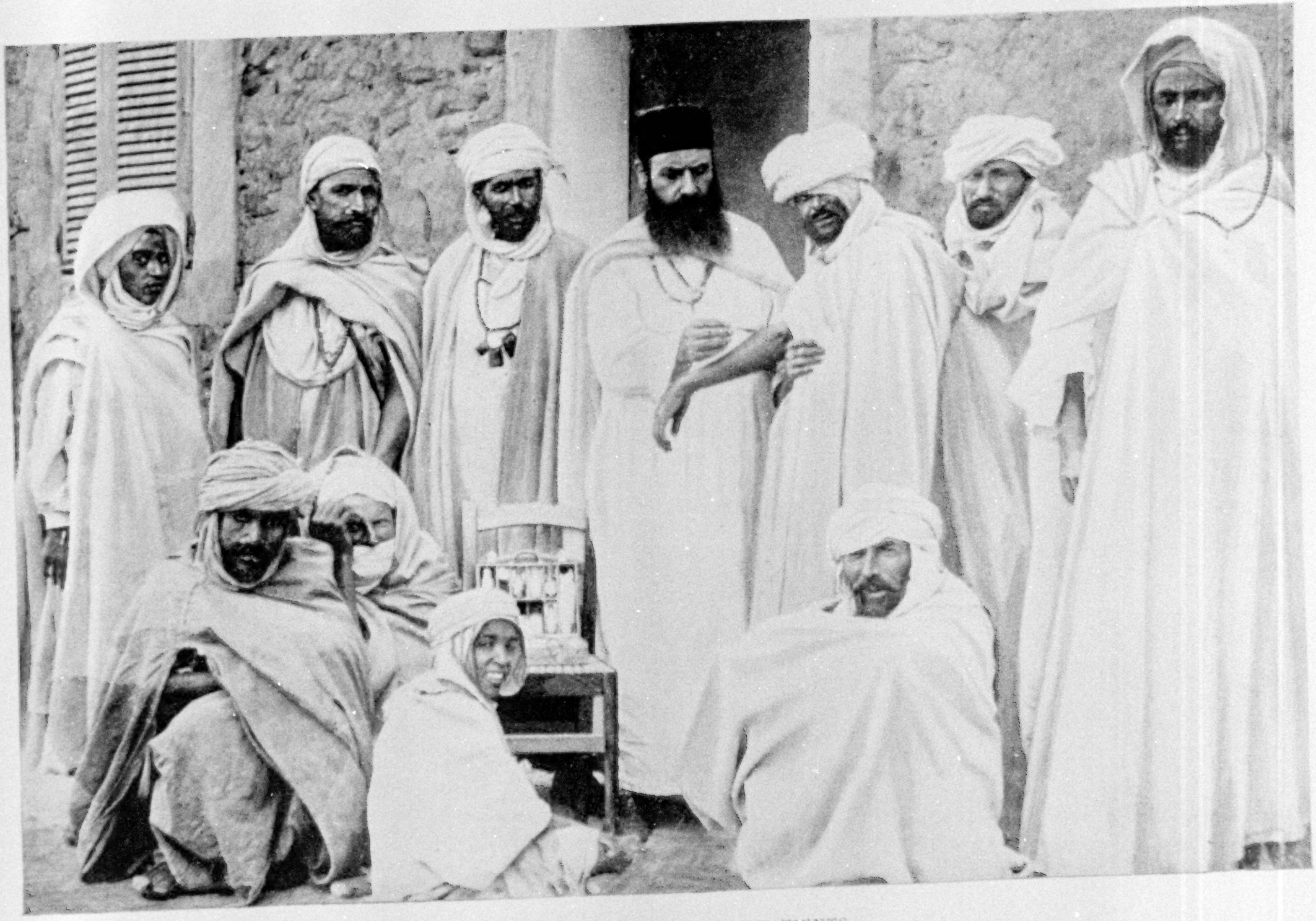
Outside every village in the New Hebrides taboo signs like those shown in the picture can be found. These queer figures are usually painted in the crudest colors—ochres, vermilions, and blacks—which are truly startling when discovered suddenly. They are erected as reminders of certain prohibitions which have received religious or magical sanction and are known as taboo.



THE PRIMITIVE WAGONS OF OPORTO, PORTUGAL

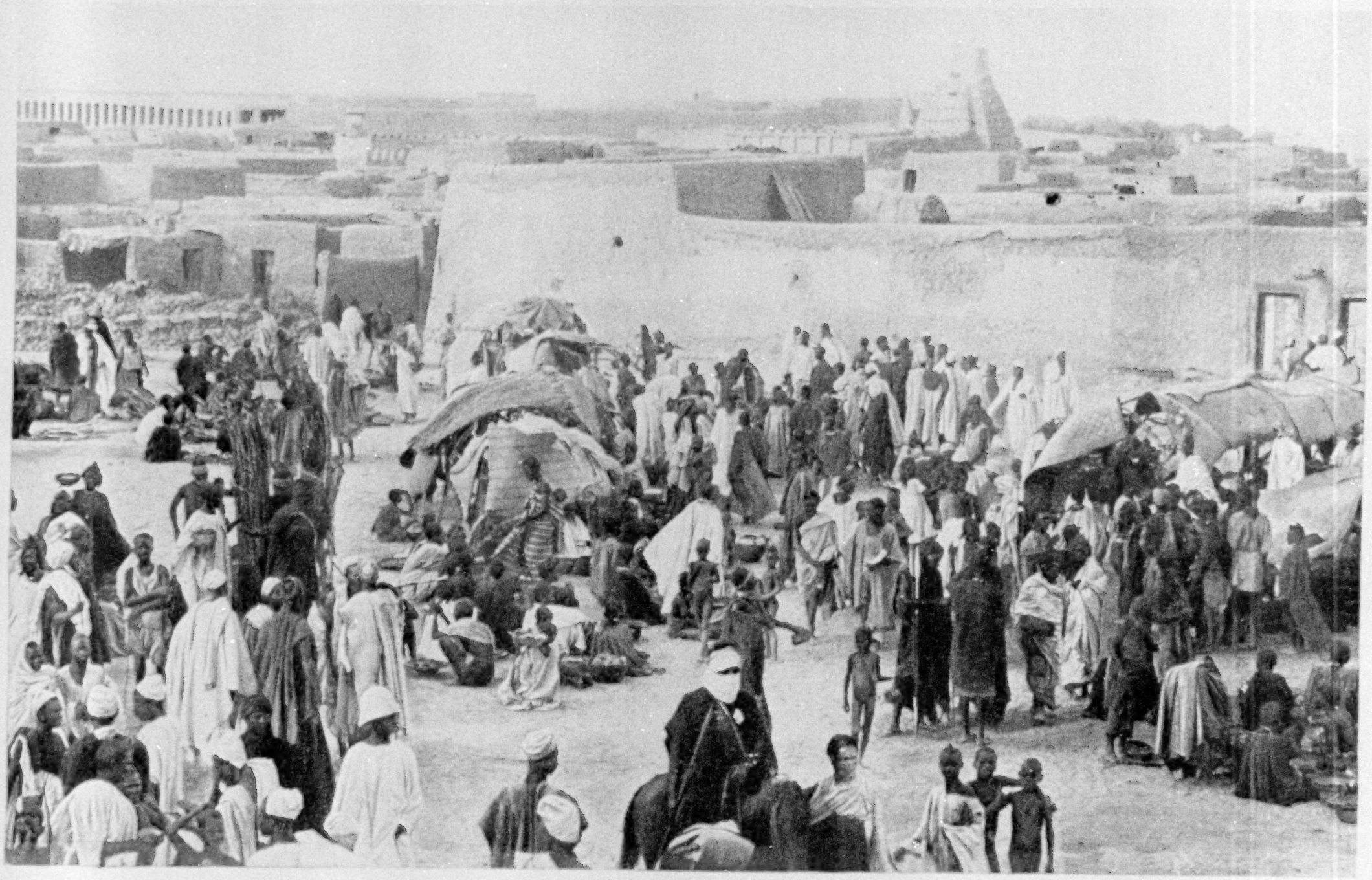
Except the street cars and a few cabs, most of the vehicles seen in the streets of Oporto are the primitive wooden-wheeled carts shown here. To add to their quaintness, they are drawn by oxen remarkable for the length of their horns, the final touch of novelty being the elaborately carved yoke to which the oxen are harnessed. Such ox-carts might have been used by King David when he moved the Ark from Shiloh.

XUM



A WHITE FATHER AND HIS PATIENTS

The White Fathers are a congregation of Roman Catholic priests charged with the evangelization of Northern Africa, particularly of the Mohammedans. They were founded in 1868 by the famous Cardinal Lavigerie



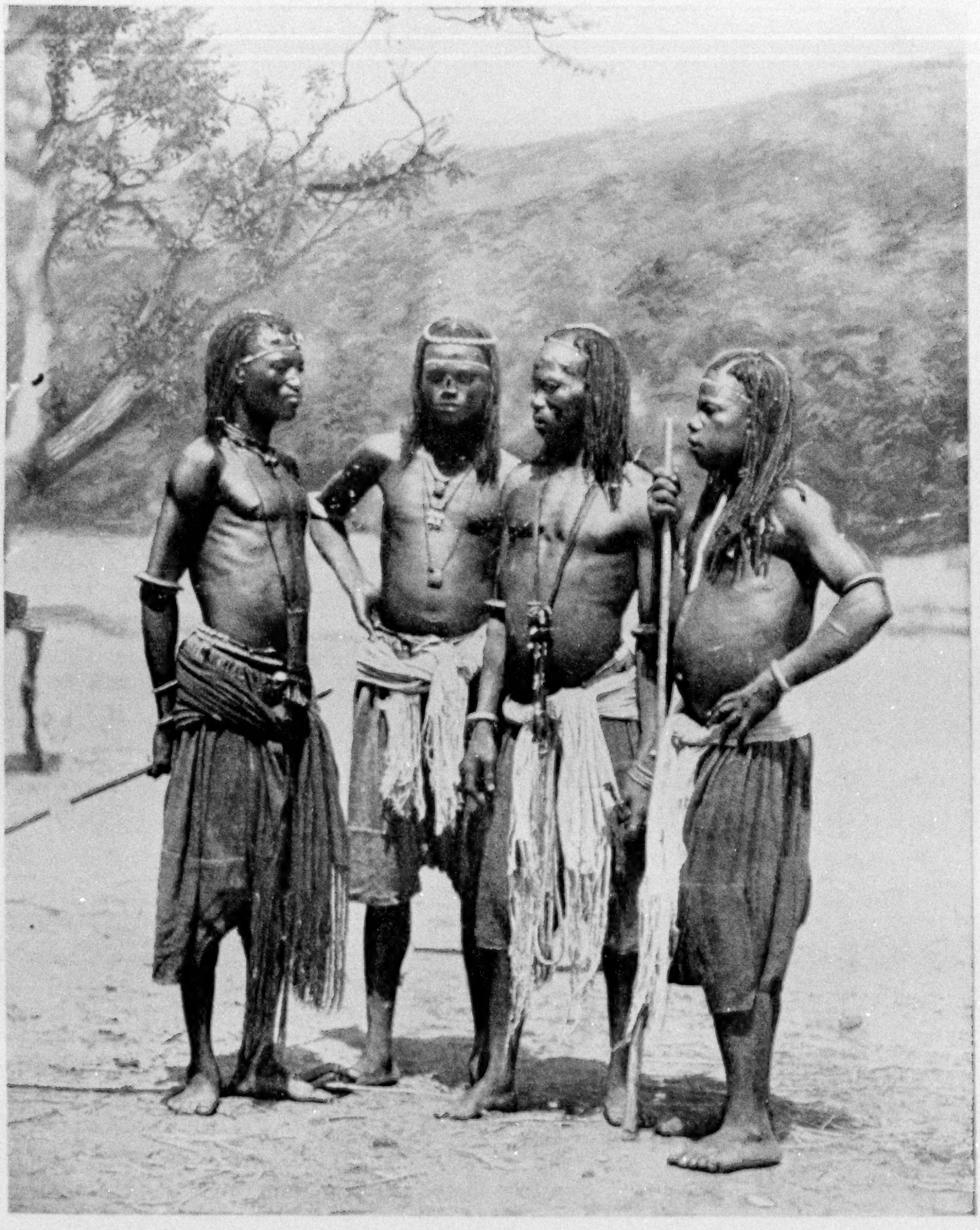
A MARKET IN TIMBUCTU

This city was at one time the capital of a vast African empire and had a population of several hundred thousand. Its glory has departed and it has shrunk in size until it now contains only some 5,000 souls. It is still an important distributing center and does a large export trade in salt, feathers, and gum. It is a French military post, has a permanent telegraph station, and is renowned through all northern Africa for its university and other Mohammedan schools.

XUM

TUAREG CHIEFS WAITING AUDIENCE WITH THE FRENCH COMMANDANT AT TIMBUCTU

The Tuareg is easily recognized by his veil, which he discards under no circumstances, deeming it shameful to be seen with uncovered face. This veil, the *litham*, as it is called, was primarily adopted as a protection from the choking sand of the Sahara. It is also used by European travelers, who find that it prevents thirst to a remarkable extent. The Tuaregs had at one time a very bad reputation, but have been reduced to comparative quiet, as the strong arm of France has made itself more and more felt throughout the Sahara.

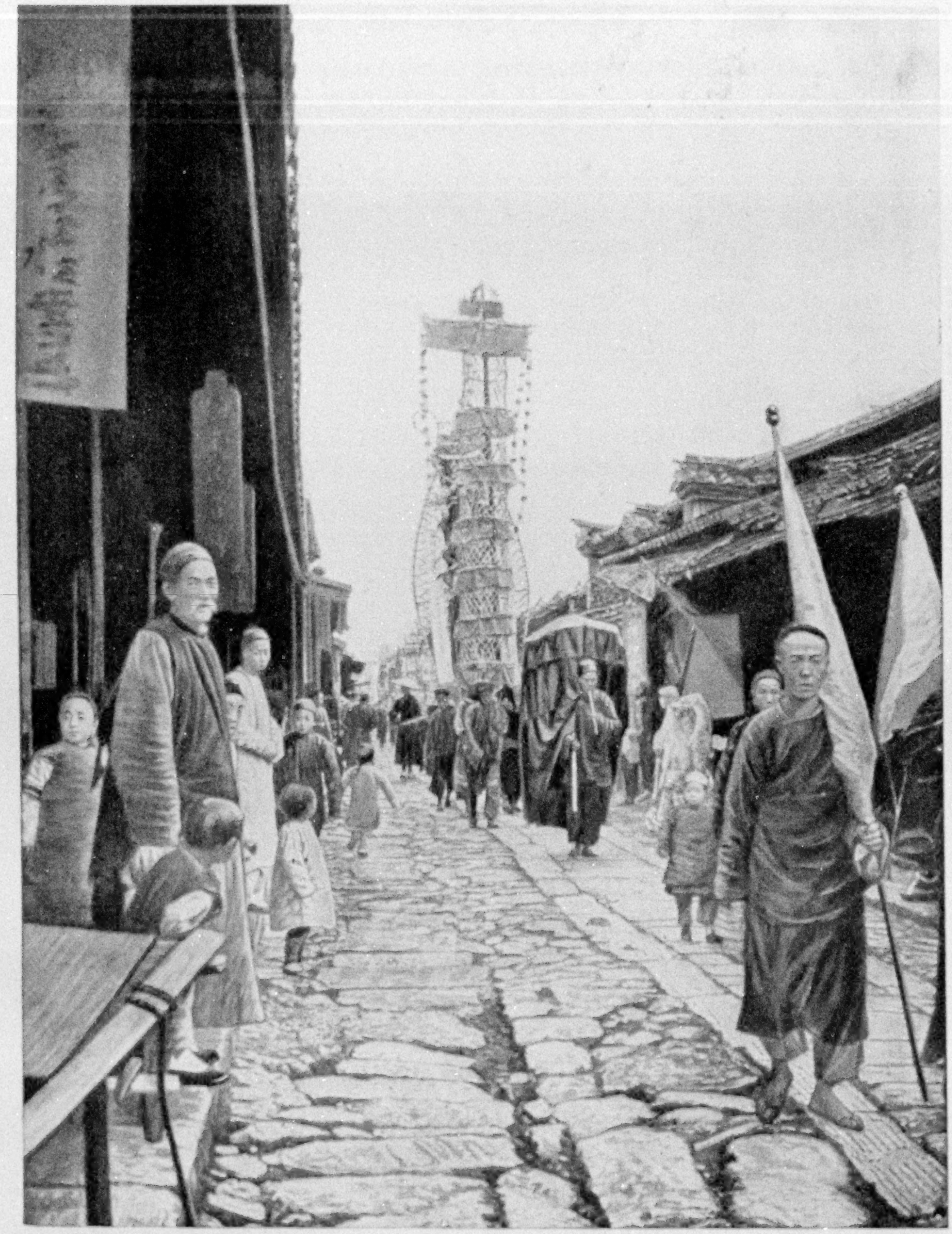


SENEGAL TYPES

These hardy African mountaineers never knew a master until they were with difficulty subdued by the French. They are still impatient of control and from time to time are a source of trouble to the authorities.

The official costume of a mandarin in Annam is a rich robe of silk, covered with magnificent embroidery, having enormous open sleeves, lined with silk of another color or with cloth of gold or silver. The head-dress is the most curious part of the official insignia; it consists of papier-mâchié hat, elaborately lacquered and gilded, in shape not unlike a bishop's mitre. A servant holds over him a canopy of scented grass or feathers.

XUM



A FUNERAL IN YUNNAN

Yunnan is a province in the southwest of China, lying next to Burma and Tibet, and is one of the richest in its mineral wealth, producing gold, silver, lead, and tin. Some of the best varieties of Chinese tea are also grown there. The people inhabiting it are Lolos and not Chinese, but they have adopted the Chinese language, religion, and customs, so that this picture is a typical Chinese funeral. The color of mourning is white, not black, and the men at the head of the procession are carrying flags of this color, which they will later erect over the grave. The curious-looking towers carried behind the coffin are supposed to ward off evil spirits and prevent their coming near the funeral procession.

LOLO WOMEN

The aboriginal inhabitants of the province of Yunnan, the southwesternmost division of China, are the Lolos, of all races the most intractable under Chinese rule. They are a hardy race of agriculturists and one of the most industrious types in China. Outside of agriculture they are famous as miners, having manned the government mines since their first opening, countless centuries ago. The musicians of the private orchestras of mandarins all over China are drawn from this people, who have also a great reputation as dancers.

XUM

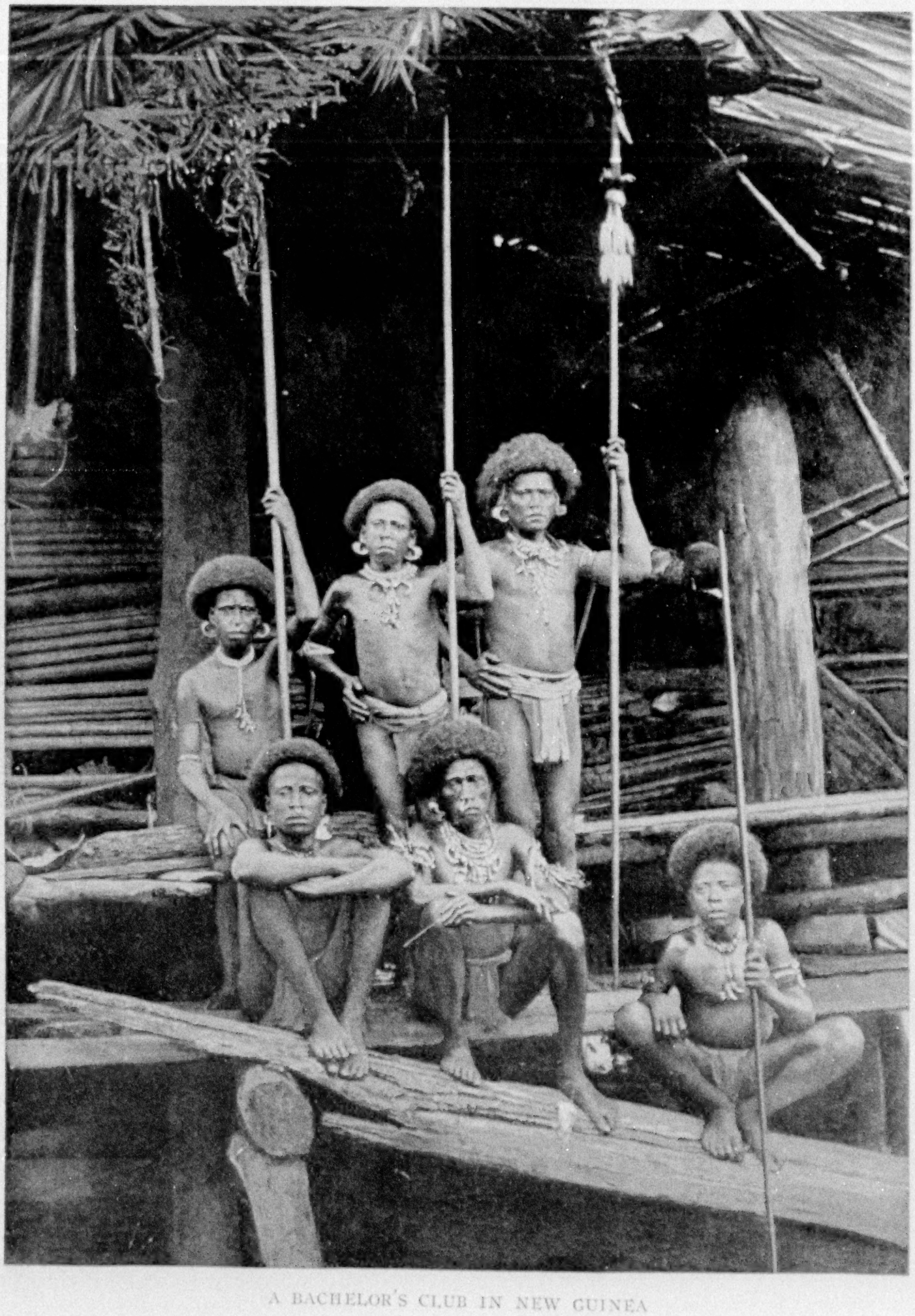
IN THE FIJI VENICE

The little village of Rewa, on Viti Levu, the largest island in the Fiji group, has been called by the English "the Venice of Fiji." It lies at the mouth of the Rewa River, which flows through a delta at its mouth, and the innumerable canals thus formed serve as the streets of the the village. The title is a little absurd, as a few hundred straw huts placed on the banks of the canals can hardly be compared to the wonderful city on the Adriatic; but, like Venice, its streets are canals and its vehicles boats. The Venetian gondola is here replaced by an equally curious craft, the painted canoe, and the one shown in the picture is a fine example of the largest kind.

XUM

A GROUP OF ACTORS IN THE TSAME FESTIVAL

From time to time, at every lamasery in Tibet, Mongolia, and Siberia, these festivals are held, the chief attraction being what has become known among Europeans as "devil dances." This is quite a misnomer, for the dances are really approximate to the mediæval miracle play. The participants are the monks of the lamasery, who, in costume and mask, represent gods, devils, mythological kings, and other characters traditional in the dance. In the center of the picture we see one of the gods with two unmasked attendants; the four small masked figures are imps, and at each end are a countryman and a skeleton; two lesser gods complete the group. The venerable figure with the long, white beard is one of the sages who relates the story as the dance progresses.



A BACHELOR'S CLUB IN NEW GUINEA

The Papuans, as the inhabitants of New Guinea are called, have a curious method of educating the young men. At the age of ten years every boy goes to live at the "Ibitoe," or Bachelors' Club, which he does not leave until his marriage. These clubs are often very large and are always situated at the extreme end of the village. Between 15 and 16 years of age the boys are initiated as warriors by being sent alone upon hunting expeditions into the forest armed only with a long and somewhat brittle lance. When they pass the hunting test successfully they are then allowed to marry and to set up a house of their own.

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Next Year's Cars

By R. E. Olds, Designer

All men can see that these are some features which next year's cars must have.

Reo the Fifth is the only car in its class which offers them all *this* year.

Left Drive

The leading cars this year have left-side drive. You know that all cars must follow.

The delay on some cars is simply due to the cost of changing old-style models.

The laws in Europe compel the driver to sit close to the cars he passes. And he sits there now in the best cars built in America.

Reo the Fifth has this left-side drive. More than that, it has a single-rod center control.

All the gear shifting is done by moving this rod only three inches in each of four directions.

There are no side levers to block one front door. There are no center levers to block entrance at right. Both brakes are operated by foot pedals. So the Reo driver is never forced to dismount in the street.

Another year, cars with levers in the way will hardly be considered.

Big Tires

Skimpy tires are also going out. Big tires are costly. But they save the extra, over and over, in cost of tire upkeep.

We could save $60 on Reo the Fifth by using smaller tires. But your cost per mile would be twice as much.

Set-in Lights

All the best cars now have set-in dash lights—electric lights — instead of projecting oil lamps.

Note all the fine models. Projecting lamps, by another year, will be sadly out-of-date. Reo the Fifth, like all the best cars, abandoned them this year.

Fine Finish

Cars are also coming to lasting finish. Reo the Fifth has a 17-coated body. It has genuine leather upholstering, filled with the best curled hair. Even the engine is nickel-trimmed. And every detail shows the final touch.

Cars skimped in these things, however well they look today, will very soon look shabby.

Watch these features. They are visible, conspicuous. The lack of them, to every man who sees it, marks a passing type of car.

"Geographic readers may depend upon the character of our advertisers."

Better-Built Cars

Men are also coming to well-built cars. By the Reo standard, this is what that means.

Our steel is made to formula. Each lot is analyzed twice.

Gears are tested in a crushing machine of 50 tons' capacity. Springs are tested for 100,000 vibrations.

All driving parts are made one-half stronger than necessary. That leaves a vast margin of safety.

Each engine is given—for 48 hours—five very radical tests.

Costly Parts

We use 15 roller bearings, 11 of them Timkens. Common ball bearings would cost one-fifth as much.

We use 190 drop forgings, to avoid risk of flaws. Steel castings cost half as much.

We use a $75 magneto, a doubly-heated carburetor, a smokeless oiling system, a centrifugal pump.

We build slowly and carefully, grind parts over and over, employ countless tests and inspections.

Does It Pay?

A car without these extremes, on fair roads for one summer, may serve about as well as the Reo. But the second year brings costly repairs. From that time on the upkeep is excessive.

I am building a car to run in five years as well as it runs when new. It is costly to build, but I save the extra by building a single model.

Thus we offer a car, built as I describe, at a price which none will match. Will it pay to get a lesser car?

Sold by a thousand dealers. Write for our catalog and we will direct you to the nearest Reo showroom.

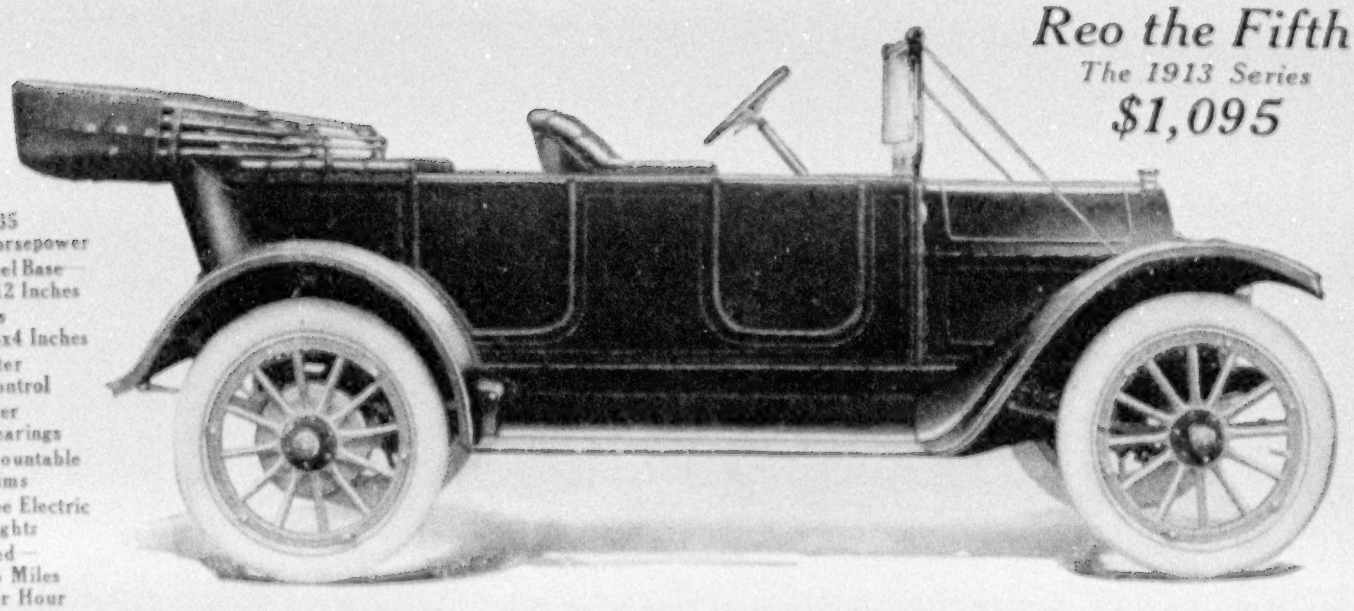
R. M. Owen & Co. General Sales Agents for **Reo Motor Car Co., Lansing, Mich.**

Canadian Factory, St. Catharines, Ont.

Reo the Fifth

The 1913 Series

$1,095



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Speed—45 Miles per Hour
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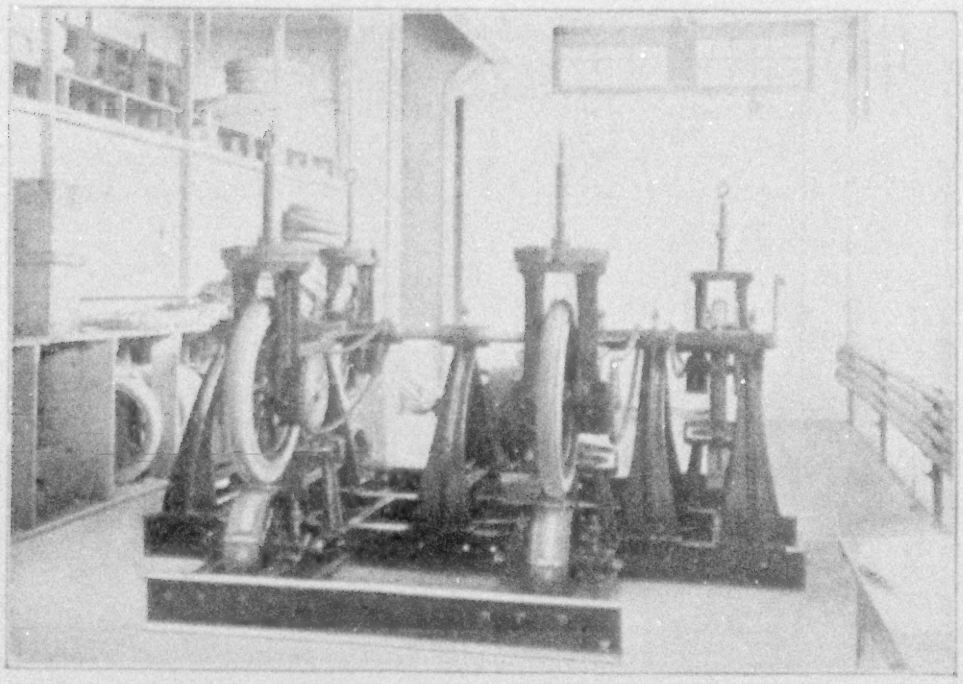
Top and windshield not included in price. We equip this car with mohair top, side curtains and slip cover, windshield, Prest-O-Lite gas tank for headlights, speedometer, self-starter, extra rim and brackets—all for $100 extra (list price, $170).
Gray & Davis Electric Lighting and Starting System at an extra price, if wanted. (196)

No-Rim-Cut Tires



This Machine Tells Mileage

This is how we know that Goodyears show the lowest cost per mile.

This machine, running night and day, wears out four tires at a time under road conditions.

Meters record the mileage.

Here we compare fabrics and formulas, methods and processes. Here we compare rival tires with our own.

Goodyear tires, as made today, are the final result of these countless comparisons.

This is part of our department of research and experiment — a department which costs us $100,000 per year.

There scores of our experts spend their time in seeking ways to better tires.

But every new idea—every seeming improvement—has to meet this mileage test.

That's the main reason why Goodyear tires have come to outsell all others.

We proved them best on this machine, by actual metered mileage. Then the meters on countless cars told the same story this did.

And no other tire, while these methods are used, is likely to equal the Goodyear.

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10% Oversize

Do You Know—by Meter—Any Equal Tire?

You who use our rivals' tires—have you ever proved them better?

Have you ever compared them as we compare them, by actual metered mileage?

Or do you use them because your favorite dealer happens to sell those tires?

What Tests Did

Some 300,000 other motorists have actually proved the Goodyears. They have used two million of them.

They found immense economy. Savings so large, so convincing, that they told the facts to others.

This is how we know:

The demand for Goodyears has grown like a flood—doubled over and over—in the past few years.

Last year's sales by far exceeded our previous 12 years put together.

These tires, once in bottom place, now far outsell all others.

Doesn't that show clearly what the meters told about these premier tires?

New-Type Tires

No-Rim-Cut tires—which we control—opened the way to end rim-cutting.

And, by actual statistics, rim-cutting ruins 23 per cent of all old-type tires.

Our 10 per cent oversize, under average conditions, adds 25 per cent to the tire mileage.

Our tire-making machine—controlled by our patents—gives every inch of every layer exactly equal tension.

Our double-cure process, which adds to our cost about one million dollars per year, adds further to the mileage.

These things together have won for Goodyears the topmost place in Tiredom.

Let Them Show

Let Goodyears show what these perfections mean.

Tires are too costly to be bought by guess. Make some comparisons, then get the tires your meter marks as best.

That has brought hundreds of thousands to Goodyears. It will this year bring hundreds of thousands more.

You have the same wants they have. The facts that won them will win you.

GOODYEAR
AKRON, OHIO

No-Rim-Cut Tires

With or Without Non-Skid Treads

Write for the Goodyear Tire Book—14th year edition. It tells all known ways to economize on tires.

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For The June Bride

Bridal presents, beautiful and useless were once the rule rather than the exception.

Now, costly bric-a-brac is being discarded for things at once beautiful and useful. The bride is a home maker, and there can be no more suitable present for her than articles genuinely helpful in home making.

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is beautiful, serviceable and inexpensive. It will give real joy and satisfaction to the newly married ones, be of daily service to them for years and keep your kindness long in memory. You can buy a full dinner set at a very reasonable price.

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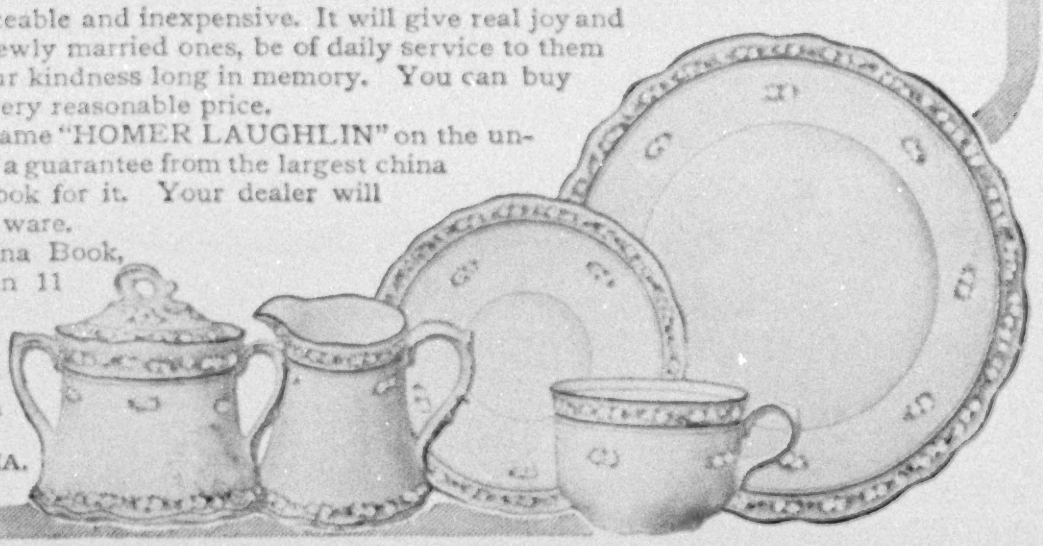

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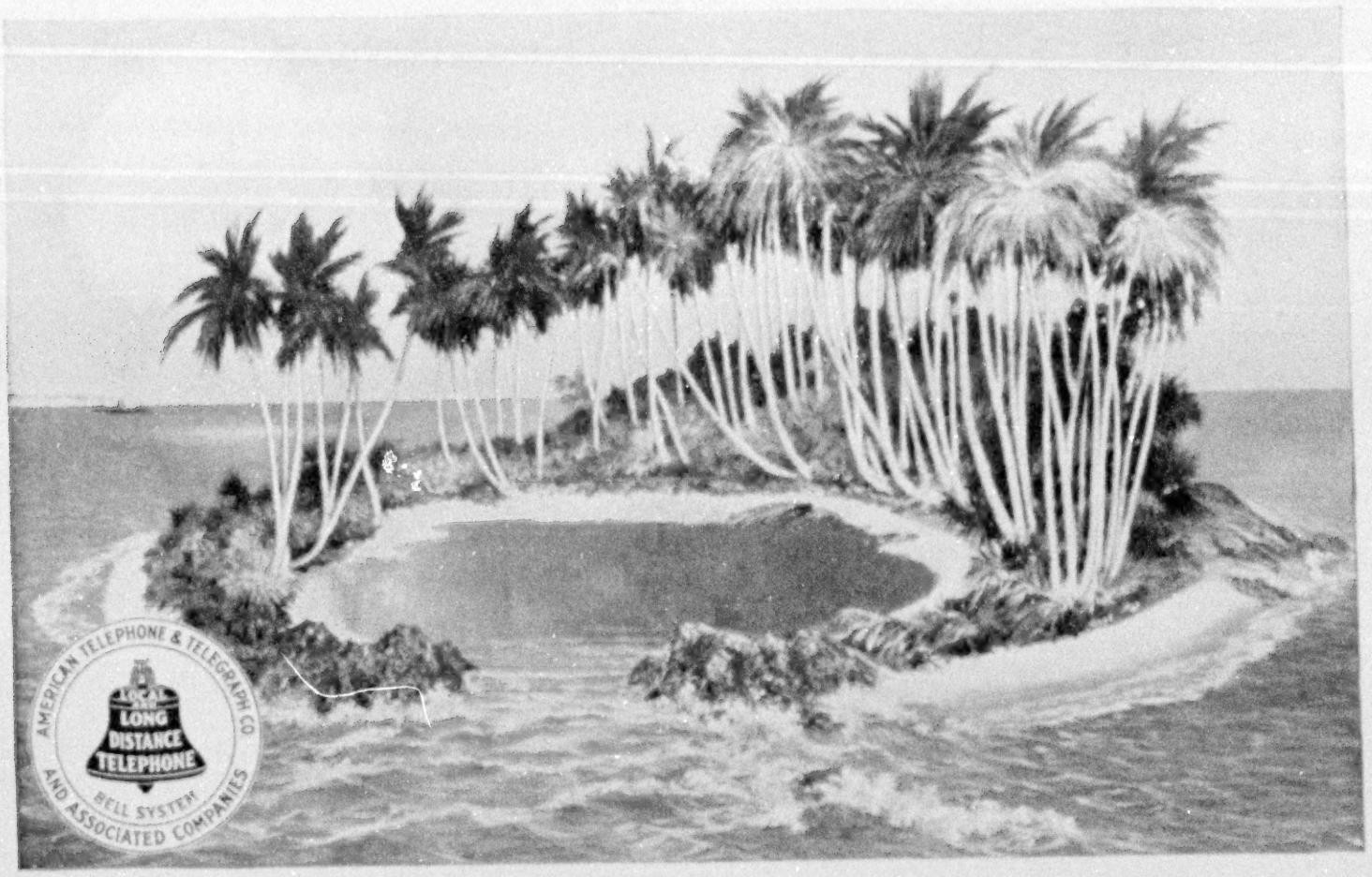

Coral Builders and the Bell System

In the depths of tropical seas the coral polyps are at work. They are nourished by the ocean, and they grow and multiply because they cannot help it.

Finally a coral island emerges from the ocean. It collects sand and seeds, until it becomes a fit home for birds, beasts and men.

In the same way the telephone system has grown, gradually at first, but steadily and irresistibly. It could not stop growing. To stop would mean disaster.

The Bell System, starting with a few scattered exchanges, was carried forward by an increasing public demand.

Each new connection disclosed a need for other new connections, and millions of dollars had to be poured into the business to provide the 7,500,000 telephones now connected.

And the end is not yet, for the growth of the Bell System is still irresistible, because the needs of the people will not be satisfied except by universal communication. The system is large because the country is large.

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An absolute necessity for long voyages

TEN VARIETIES

Packages of about 5 ounces each
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In tins of about 16 lbs. each
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do this. Do this—draw razor blade between thumb and fore-finger moistened with 3-in-One. Rub a few drops into strop. Then strop.

The microscopic saw-teeth of a razor's cutting edge rust. This dulls the blade. 3-in-One prevents surface rusting. Stropping wipes the edge clean, breaking off all dull, rusted steel particles. You get a brand new set of sharp teeth for every shave.

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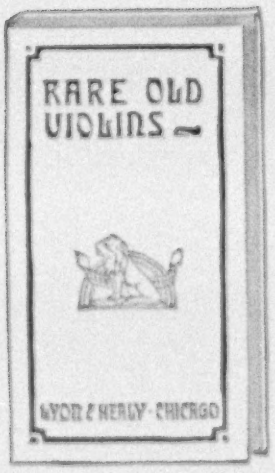

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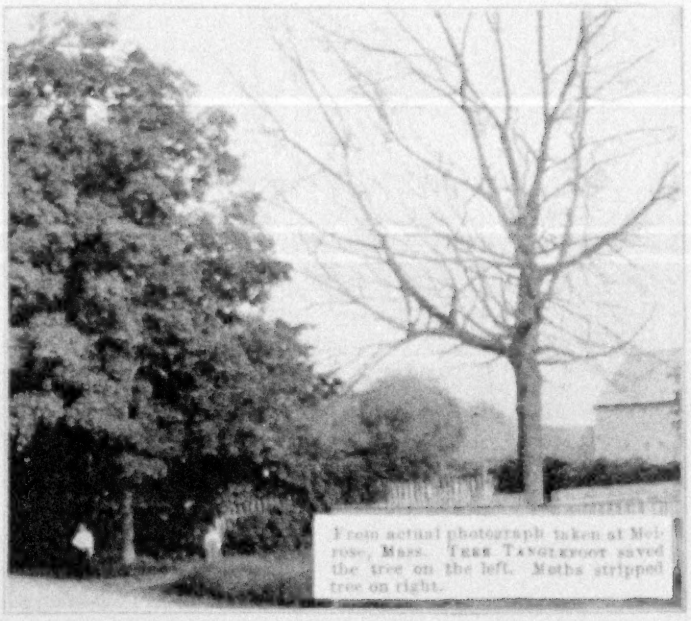

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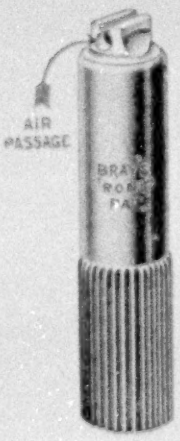

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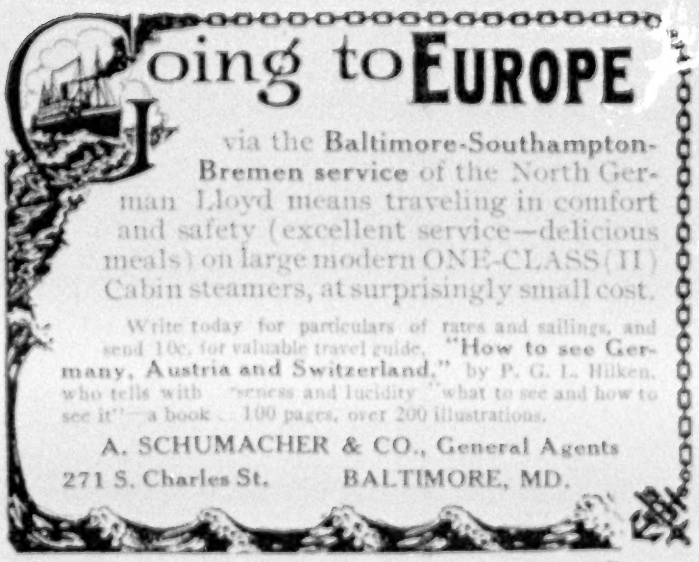

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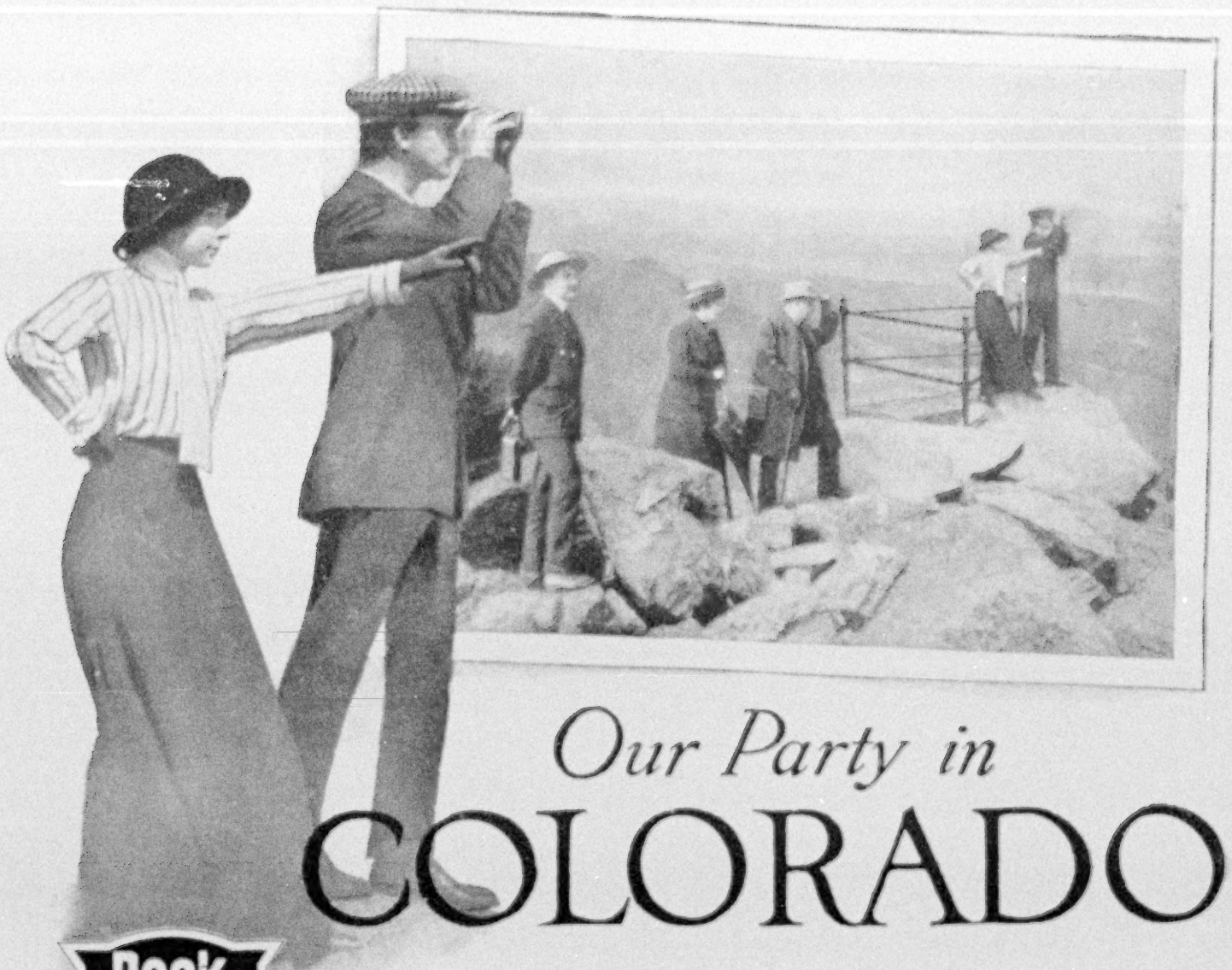

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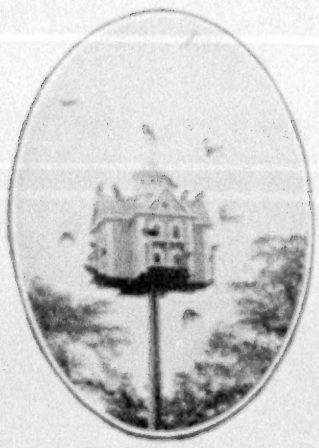

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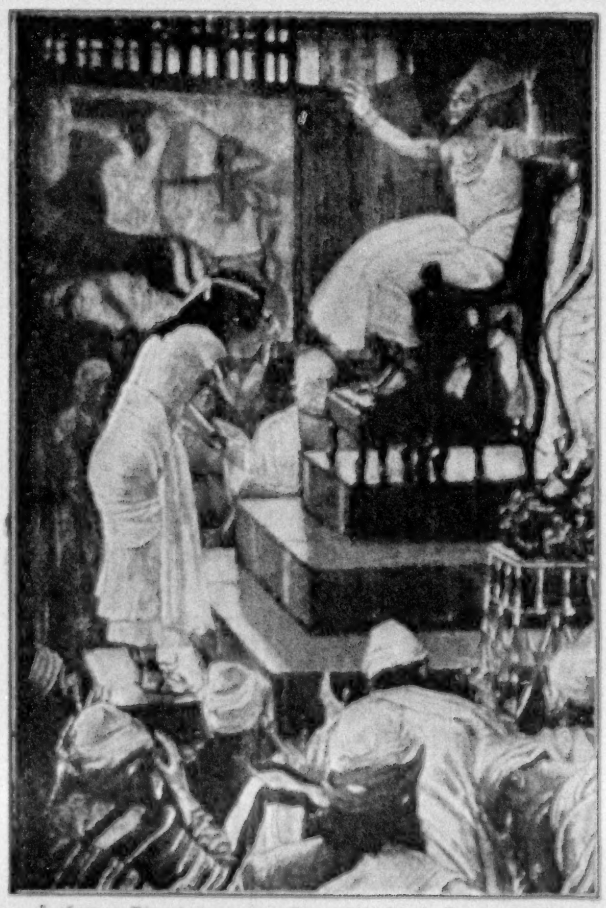

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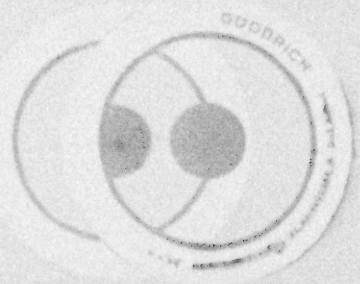

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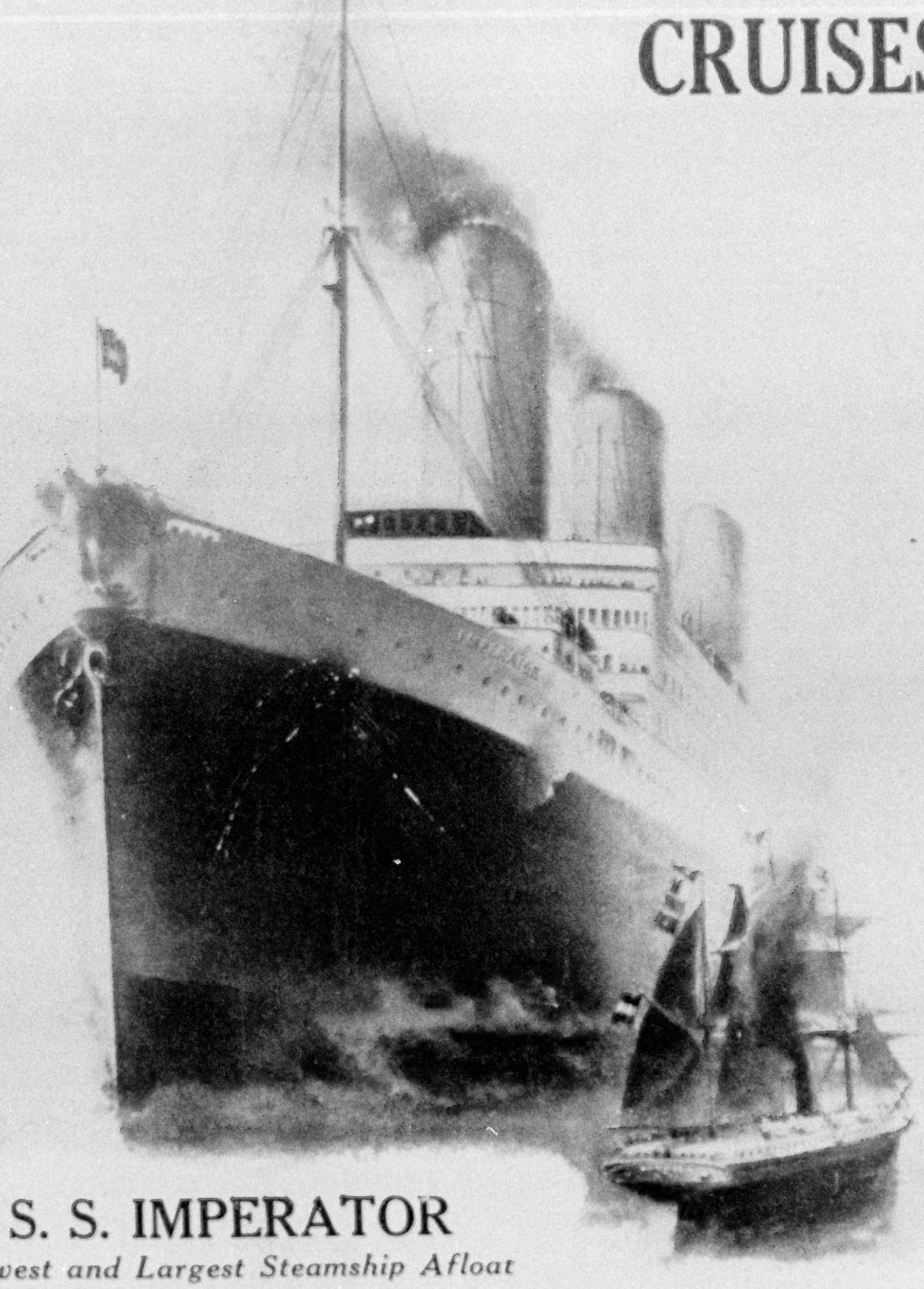

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